Editorial

AN interesting exhibit at the Sydney Royal Agricultural Show was the experimental Frequency Modulated transmitter which the PMG intends to use in its initial tests in the Sydney area.

It might be in order to emphasise that these initial tests will have no real value to the listening public. Moreover there is no guarantee that a permanent service, when it does come, will use the same frequencies, or have other technical features similar to those used in the tests. The real purpose of these first transmissions is to gain the experience upon which ultimately these matters wil be decided.

We have been doing our own experimenting with U.H.F. transmission and reception during the last few months, and have obtained some very interesting results. Our cover picture is, in fact, a photograph of a simple oscillator transmitter of low power operating on the 166 mc. amateur band, the foreruner of more powerful equipment we have in mind. But some of our most interesting results have been obtained in the matter of aerials for use on both the 50 megacycle and 166 megacycle bands, which are above and below the tentative F.M. frequency of about 90 megacycles.

Most of the transmissions have been carried out from the top of our building, one of the highest spots in Sydney, and quite a good location for this work. We have found that using a power of 100 watts with amplitude modulation, excellent reception is obtained in all Sydney suburbs, and as far as the Blue Mountains, even with simple receivers.

The actual strength of reception, however, depends to a marked degree on the type of aerial used. A wire round the picture rail, or even a good "straight" aerial, is rarely satisfactory on 50 megacycles and higher.

In some tests with our Technical Editor located in Merrylands, for instance, it was found that using a half-wave type of aerial, signals could be heard at good strength which, on an ordinary outside wire of haphazard length, were almost inaudible. The use of a slightly more elaborate aerial using two half-waves resulted in very strong reception and transmission over the same path.

Now a feature of F.M. transmissions is that, unless the receiver is fed with a definite minimum strength of signal, it will not work as it should. The conclusion is, therefore, that if the full range of the F.M. transmissions is to be realised, properly designed and erected aerials are an essential. There need be nothing very elaborate about them, but any old piece of wire just won't do.

We hope that when manufacturers make F.M. sets available at the appropriate time in the future, they will realise this point, and supply aerial kits, properly matched with their products. The enthusiastic radio fan can, of course, replace the simple types by erecting more complicated aerials with considerable improvement in reception. By the time these will be required, we hope to have worked out a number of designs for the job, with receivers to go with them.

John Moyle

INDEX

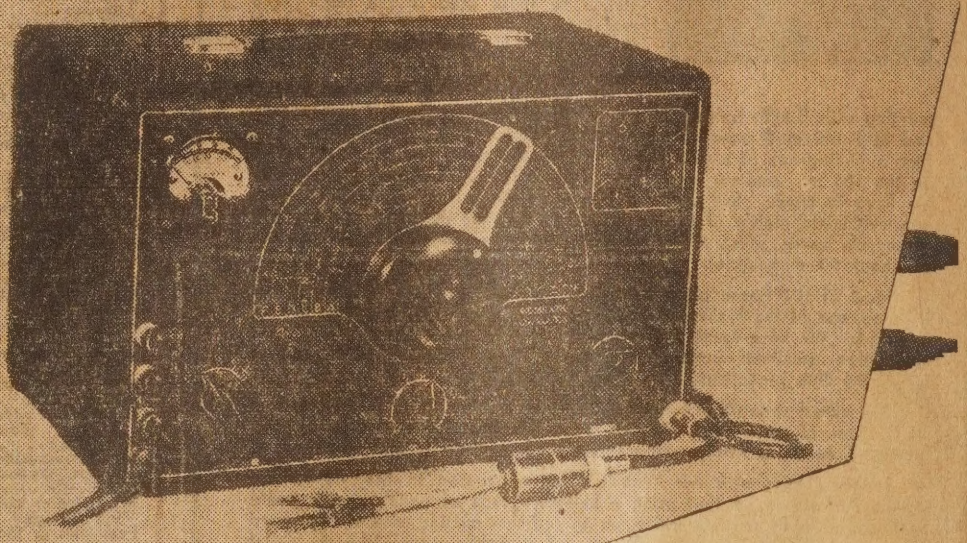
EDITOR: JOHN MOYLE, M.I.R.E. (VK2JU)

TECHNICAL EDITOR: NEVILLE WILLIAMS, A.M.I.R.E. (VK2XV)

ANNOUNCING

The Palec Modulated Oscillator

MODEL MO1



THE newly released "Palec" Modulated Oscillator Model MO1 has been developed to cater for the exacting requirements of up-to-date radio servicing.

Many of the essential features developed for our factory type Signal Generator Model S.G.1 have been utilised, resulting in a robust and reliable instrument with a performance unexcelled in its price field.

SPECIFICATIONS

The unit comprises a Colpitts oscillator covering the range 150 K/cs.-30 M/cs. in six direct reading bands. The coils are permeability tuned . . . Calibration accuracy 1% . . . Dial is a vernier type of 54:1 ratio . . . The output of the oscillator is fed to a cathode follower stage to overcome frequency modulation and attenuator reaction . . . 400 C.P.S. modulation is fixed at 30% . . . An unprecedented feature is the attenuator, a heavy cast machined unit of Signal Generator pattern which provides attenuation within ± 1 db in five steps with an impedance of 11 ohms on the lower settings . . . Triple shielding ensures leakage less than 1.0 microvolt at all frequencies . . . Approximate output voltage is from less than 1 to 100,000 microvolts . . . Power supply 210-270 volts A.C., 40-60 C.P.S. . . . Supplied complete with detachable dummy antenna, co-axial leads and 24-page instruction booklet. Dimensions: 14" x 8¾" x 8½". Weight: 26 lbs.

Available in two models: MO and MO1, the latter having a built-in 3-range A.C. output meter for alignment purposes. External vibrator unit for battery operation extra.

Price—£32/17/6, plus £4/17/6 for built-in output meter model. Terms arranged.

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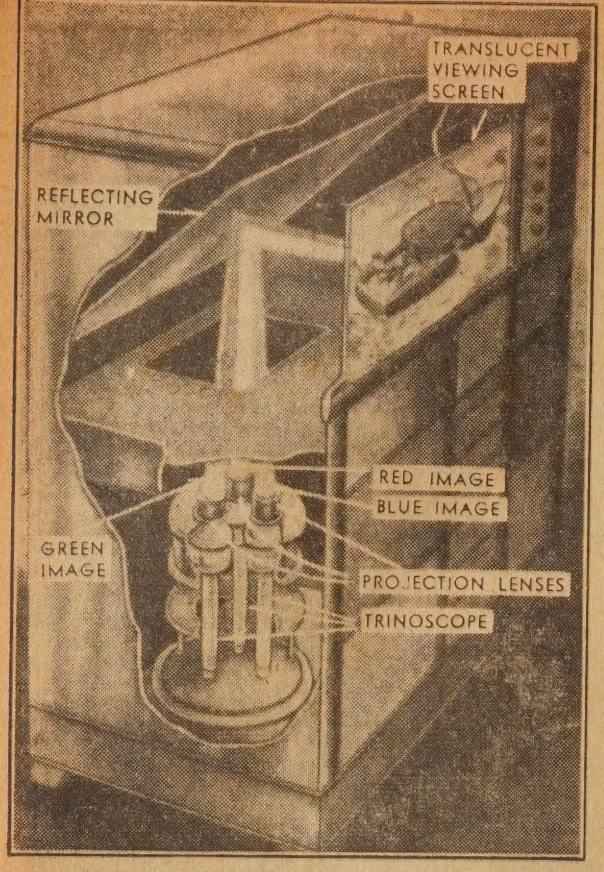
FROM EAR TRUMPET TO MODERN AID

This little lady fortunately is not deaf, but she demonstrates a new hearing aid for use by those who are. It is smaller than a package of cigarettes and lighter in weight than the average woman's compact. It features a tiny beam-power valve, and a capsule-size 15 volt battery said to have the power of the largest 45 volt hearing aid B batteries. The aid is not yet available in Australia and contrasts with the old ear trumpet.



Drawings of RCA all-electronic color television receiver showing how images on the three kinescopes of the trinoscope are projected onto a mirror and then to the viewing screen where they blend to reproduce the original scene in its natural color.

What appears to be a big forward step in the development of color television has been made in a new technique described in this article. It should be noted that there is no new optimism about the time expected to elapse before any system of color television becomes a commercial proposition.

Color Television

by new electronic method

ELECTRONIC color television pictures, produced by all-electronic means has been developed by Radio Corporation of America at RCA Laboratories, Princeton, NJ.

A demonstration, revealing a revolutionary development in radio science, proved that flickerless, all-electronic color television is practical without rotating discs or other moving parts.

This new system, the engineers explained, is a complete departure from mechanical color, shown in various forms since 1925. It is pointed out that the time period estimated in December, 1945, when it was said that five years would be required to bring any color system to the present status of black and white television still holds.

It was further disclosed that a simple, inexpensive radio-frequency converter makes it possible to introduce this all-electronic color television system without causing obsolescence of black-and-white television receivers.

A new color slide television camera, used in the demonstration, produces signals from 35 mm. Kodachrome slides. Transmission of the pictures on the slide is achieved in natural colors when a light beam from a kinescope is focused through the slide and separated into component colors by a system of mirrors and photo-electric cells.

Each of the three transmitted images—red, blue and green — is of the same number of lines, that is, 525; also the same horizontal scanning rate and the same picture repetition rate of 30 pictures a second as in present commercial television broadcasting.

The receiving set is equipped with three 3-inch kinescopes, which separately receive the signals representing red, blue and green. This trio of kinescopes is called a trinoscope. From it the three color images are optically projected into a brilliant composite picture which appears on a 15 x 20-inch screen in natural color, free from any flicker, color fringes or break-up of color.

By this new advance in television, simultaneous color transmission, instead of sequential transmission, color by color, is achieved.

Since the electrical characteristics and all of the standards of the green image—including the synchronising pulses—are identical to those of the present black-and-white standards, any broadcasts from color stations using the electronic simultaneous system can be received clearly on black-and-white receivers by the addition of the easily installed radio-frequency converter. No modifications whatever are required inside the set.

This converter will enable present-day television sets to receive color programmes and reproduce them in black and white, even when transmitted on ultra-high frequencies. Thus, existing receivers will not be made obsolete by the introduction of color at some future date.

On the contrary, their usefulness will be extended. For example, if a football game is broadcast by a color transmitter, the owner of a black-and-white receiver can see in black and white. Even the first television sets introduced at the time of the World Fair in 1939 can be adapted to tune-in the electronic color pictures in black and white.

Likewise, it will be possible for electronic color television sets to receive the broadcasts of black-and-white stations. Furthermore, when electronic color television is established as a broadcasting service, the black-and-white receivers will be able to reproduce the color broadcasts in monochrome. Engineers explained that this cannot be done with any known system of mechanical color.

Using this method, a station owner can begin with a black-and-white broadcast service. He may operate a monochrome transmitter on low frequencies and also an electronic color transmitter on ultra-high frequencies using the signal of the color camera to operate both transmitters. With such a dual arrangement, the problem of obsolescence for the broadcaster as well as the viewer is reduced to a minimum. In fact, the broadcaster would

thereby be able to render service in both black and white and color from the same station.

David Sarnoff, President of RCA in commenting upon the development, said:

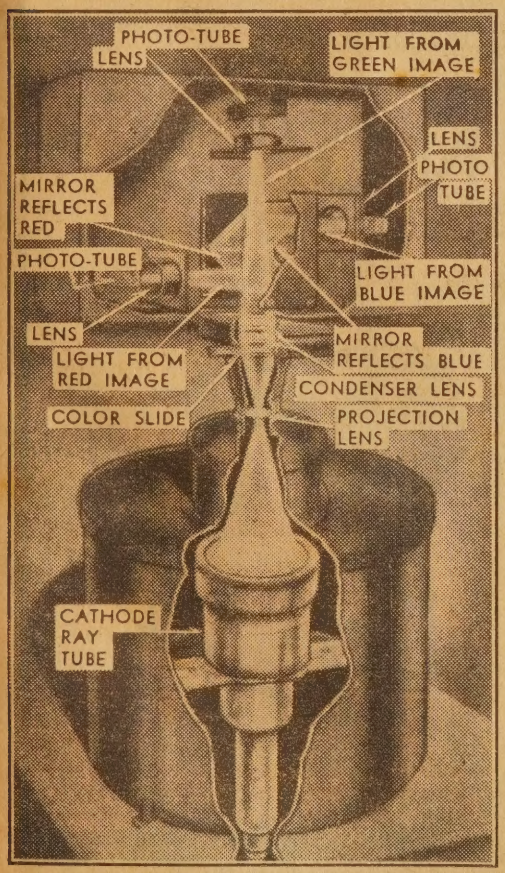
"The realisation of this universal system of television, which transmits and receives both color and black-and-white pictures with equal quality, is as far-reaching as was the creation of an all-electronic television system which supplanted the mechanical discs used in black-and-white television when it first began. The realisation of all-electronic color is as significant in television as electronic recording was over mechanical recording on phonograph records, or the present color movies over the early mechanical color on the screen."

Dr. C. B. Jolliffe, Executive Vice President in charge of the RCA Laboratories Division, declared that this development in television, takes the issue of color television out of the range of controversy. All-electronic television, he said, is far superior to any mechanical system of color with its rotating discs and other well-known limitations.

"The problem is no longer how to transmit and receive color pictures by an all-electronic method, because the basic principles have now been solved," said Dr. Jolliffe. "The problem that still challenges is how to operate television broadcasting as a steady and regular service to the public on the higher frequencies, whether in black or white or in color.

"To open the high-frequency spectrum and to make it commercially useful will require propagation studies under broadcasting conditions, development of new circuits, new tubes and new cameras, all of which must be field-tested before commercial standards can be recommended by the industry for approval by the Federal Communications Commission.

Rear view of RCA all-electronic color television receiver showing the trinoscope, comprising three cathode-ray tubes which project red, blue and green images on the mirror and viewing screen above.



At the all-electronic color camera, the light beam from a cathode-ray tube is projected upward through a kodachrome slide and through a series of color filters which separate respectively the red, blue and green portions of the image. Each color is then reflected into photocells which change the light values into electrical signals for transmission to the receiver.

Ray D. Kell of RCA, adjusts the all-electronic color camera. The cylindrical unit houses the scanning kinescope. Mirrors and photocells which convert color into electrical signals are in the upper cabinet.

"Although we have solved the all-electronic color television problem, it will require a number of years to establish color television as a service to the public," said Dr. Jolliffe. "What we have done today is to demonstrate the realisation of the principle of simultaneous electronic color television. The apparatus used in the demonstration is purely experimental as developed in the laboratories. It is not commercial equipment, but it reveals that the American people will be assured of the finest color television instruments in the future as they now have in all-electronic black-and-white television.

"Let me emphasise that the most important fact to remember in regard to color television is that any commercial system, whether it be mechanical or electronic, depends upon the ultra-high frequency spectrum in which the necessary band width for color exists. No matter how far the development of the principle and the apparatus has gone forward, there must

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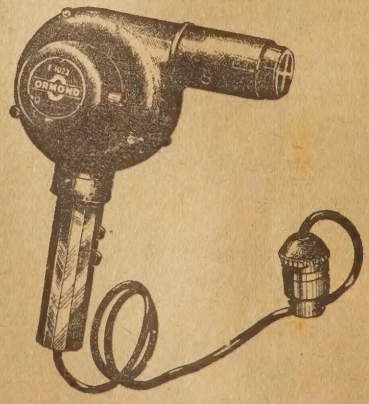

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yet be complete exploration and tests in the field of the behavior and limitations of ultra-high frequencies. We expect to complete our development of electronic color television apparatus before the ultra-high frequency spectrum is made ready for its use in a commercial way.

"This demonstration, therefore, does not change the time period estimated by us in December, 1945, that it would require five years to bring a color system to the present position of black-and-white television.

USE OF CONVERTER

"We will move along rapidly in this development, but no matter how many years pass before the ultra-high frequency spectrum is harnessed for commercial color television service, no one need fear that the black-and-white television set of today is destined for quick obsolescence. The inexpensive converter takes care of that problem. In the meantime, the development of both black and white and color television will continue to advance, and eventually will increase the service to the public.

"We have demonstrated a principle that now enables us to go forward with a timetable which is not based on a scientific theory but on the required engineering of equipment," said Dr. Jolliffe. "The system already has been perfected to a point where we now could show motion picture films or outdoor scenes in electronic color, except that we have not had the time necessary to build the essential equipment."

Dr. Jolliffe disclosed that the RCA timetable for future demonstrations of color television is divided into five stages, the first of which featured still pictures televised from color slides on a large screen 15 x 20 inches. There is no flicker. Blending of three colors —red, blue and green—is achieved simultaneously to produce a perfectly natural picture.

TELEVISION TIMETABLE

The remaining stages in the timetable of laboratory demonstrations of electronic color television were outlined as follows:

Motion picture films within 3 months.

Live-action studio scenes by the middle of 1947.

Outdoor action scenes by the latter part of 1947.

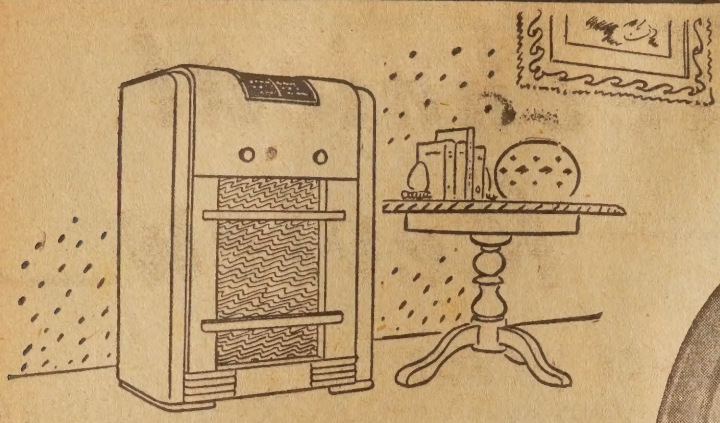
Large-screen theatre-size pictures in 1948.

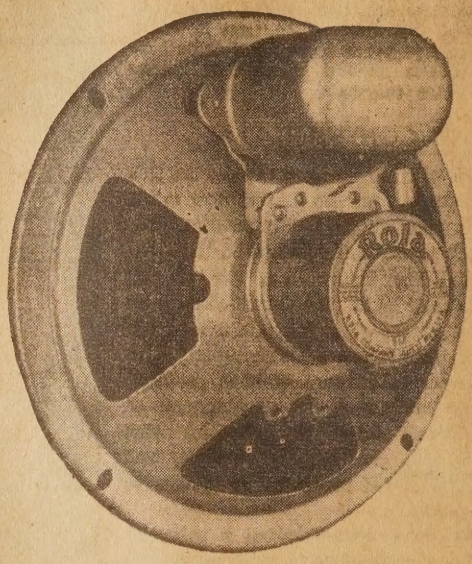
"Scientists and engineers have a complete plan for this schedule and our laboratory tests reveal that this is practicable," added Dr. Jolliffe. "We need only time to produce the necessary equipment such as cameras and tubes, so that a demonstration can be made in approximately one year, that will include all five stages at the same time, that is, the complete range of universal all-electronic color television."

MAN-MADE LIGHTNING BOLT

The College of Engineering at Duke University has taken a page from the handbook of Jove and is now making its own lightning strokes, replete with claps of thunder. The purpose is to investigate and unravel the mysteries surrounding these flashes from the heavens in order to render them harmless. Professor Charles R. Vail holds a piece of oak wood which has been split by Duke University's man-made lightning, and he places another in position to be shattered. The pair of spheres in the background is used to measure voltage.

Howard Moffatt, of Greensboro, NG, operates the half-million volt generator used to produce the artificial lightning strokes. The wire screen is used to prevent stray charges from harming the operator and his control equipment. Not shown here is a lightning arrester designed to prevent strokes from passing though the circuit.





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The ROLA 8M Speaker is eminently suited for incorporation in battery operated, AC-DC, Vibrator Powered or AC operated receivers. Wherever higher than normal speaker efficiency is called for the ROLA 8M is the speaker to use.

Here are the facts:—

The ROLA 8M is energised by a generously sized magnet of Anisotropic Alnico.

Efficiency of the ROLA 8M is appreciably higher than Standard 8" speakers.

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Specifications:—

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Technical Review

VARIABLE—RESISTANCE PICKUP

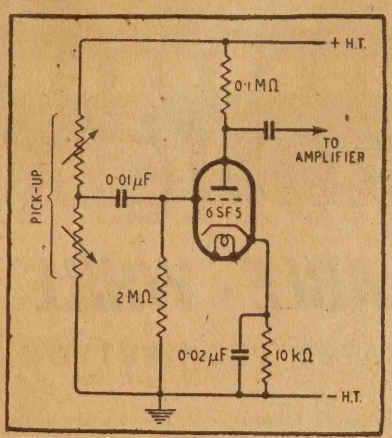
Yet another principle has been adapted and applied to a gramophone pickup, namely that of the electronic strain gauge. Movements of the stylus cause mechanical distortion of a conductor and the consequent variations in its resistance are converted into electrical signal impulses.

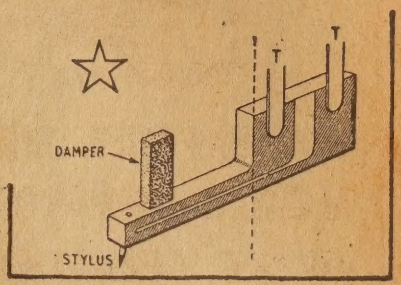
A HORIZONTAL polystyrene bar of 1-16in. square section and ¼in. long is clamped to the tone arm at one end and provided with a short stylus at the other.

The vertical faces of the bar are coated with a film of carbon powder in a plastic medium, and lateral bending causes alternate increase and decrease of resistance, depending on whether the film is in tension or compression. Over the range of deflections resulting from the playing of a record, the relationship between strain and resistance is stated to be linear.

Push-pull connection between the resistance elements is used and a pre-amplifier circuit incorporating negative-feedback frequency compensation is reproduced.

It will be appreciated that output is proportional to displacement; like the piezo-crystal pickup it is a constant amplitude rather than a constant-velocity device, and its uncorrected response curve will be flat from the lowest frequencies up to the cross-over point (say, 250 c/s) on a standard frequency record, and above this frequency the output will fall at 6db per octave.





Compensation calls for a judicious mixture of electrical and mechanical correction—the latter in the form of a rubber or plastic damping block which can be applied in a variety of ways to give the desired frequency response.

Figures for voltage output are not given, but it is stated that a stage of pre-amplification is required before the input terminals of the usual two-way audio section of a radio receiver.

Recommended values for the resistance elements are 75,000 to 100,000 ohms per side. The applied voltage should be as high as possible, but will generally be limited to 100 V by the current-carrying capacity of the carbon film.

It is stated that carbon layers have been prepared which are free from the background hiss usually associated with carbon elements.

A.W.A. MAKES UNIQUE MEDICAL RECORDINGS

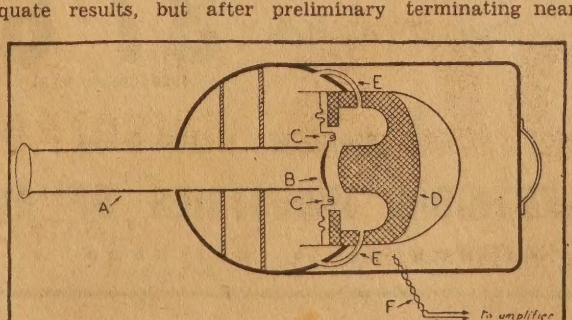
TO facilitate the demonstration of cardio-vascular and respiratory sounds, Amalgamated Wireless have produced a series of discs in co-operation with Dr. E. H. Stokes, of Sydney. The discs are described fully in a recent issue of the "Medical Journal of Australia," and in a special brochure released by AWA.

The sounds are recorded on 13 double-sided discs, which are played at the usual 78 rpm and preferably on an electrical reproducer. The first section deals with normal heart sounds and their variations, followed by a discussion of the murmurs and changes in sound and rhythm with various abnormalities and heart diseases. The second respiratory section deals with breath sounds, vocal resonance, &c.

For the preparation of the records a large number of patients were examined and about 700 sound tracks from almost 300 patients were made.

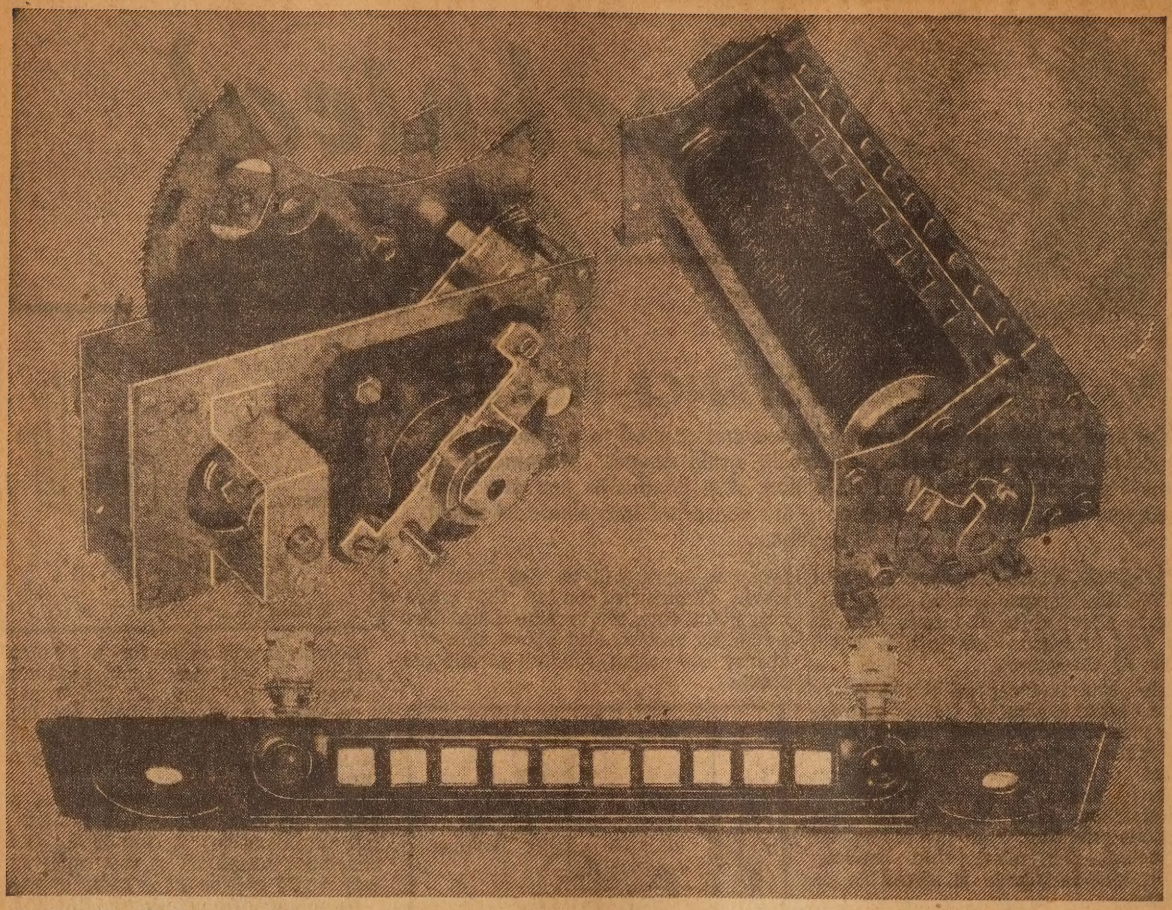
From the electrical viewpoint, special study was made of the problem of auscultation—listening to the sounds produced by the body. It was necessary to consider carefully the difference between the sounds heard by electronic means and those audible through the usual acoustic stethescope.

At first it was thought that a frequency response of between 30 and 2000 cycles per second would give adequate results, but after preliminary tests it was ultimately extended to 4000 c/s in the upper register.



For purpose of the tests, a special sound transducer was developed to convert the sounds to electrical impulses. This consisted of a bell-mouth tube just over an inch in diameter and about 5in. long. The tube was supported by passing it through a heavy rubber sphere, with one end terminating near the diaphragm of a dynamic type microphone unit.

Careful placement and handling of this unit made it possible to record the required sounds without an obtrusive background of extraneous noise caused by the patient's skin movements and by the bones in the operator's fingers.



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The single-phase motor is controllable for immediate reverse of armature rotation by capacitor switching through phase-displacement of field windings.

The handy man can adapt the equipment for many purposes . . . as a Rotary Beam Aerial Indicator unit to operate a wall map or similar directional device . . . for the remote operation of any switching action such as aerial phasing . . . for the remote tuning of receivers . . . for the motor-operation of band-switching in transmitters . . . for adaption as a "CQ Machine" for keying VHF transmitters during PX tests . . . and for many other uses obvious to the experimenter.

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SIMPLE BEAM AERIAL FOR U.H.F.

One of the advantages of ultra shortwave working for radio amateurs is the comparative ease with which various types of directional aerials can be directed and operated. The main reason is, of course, that the fundamental element—the half wave—is proportionately smaller than it is on the lower frequencies.

THIS is particularly true on the 166 mc. band where a half wave-length is a matter of inches rather than feet. However, the 50mc. band is quite a good one for the beam wireless enthusiast, whether he be a devotee of the ground plane, collinear, or broadside type of aerial.

Lately, there have been numerous suggestions in various radio journals for directional aerial systems, most of which have their own particular virtues and vices. Those which promise the greatest gain are generally the most difficult to feed, and those which are large enough to avoid critical element spacing are often bulky and unwieldy to mount.

We came across details of a very interesting beam aerial attributed to the Amphenol Company. As the illustrations will show, it is very easy to construct, and the simple combination of 75 ohm and 52 ohm cables greatly simplifies the problem of feeding and matching. On 50 mc the mounting beam will be something like 27 feet long, but this appears to be about the only disadvantage as compared with the more familiar close-spaced array.

CO-AXIAL CABLE

Incidentally, where a 52 ohm cable is specified in the diagram, the allegedly 55 ohm cable, which many amateurs possess, should be quite suitable, as the slight mismatch is not likely to have detrimental effects.

The following details are given concerning the array, together with polar diagrams which will indicate its gain and directivity.

"This broadside array is an example of a well-designed communications antenna for the 152-162 mc band. These frequencies are assigned to fire departments, police, Press, and railroads. The same array also can be used (with slightly lower efficiency) in the neighboring amateur and government bands which extend from 144 to 198 mc. Its excellent directional characteristics recommend it for fixed or mobile point-to-point service.

The electrical design is illustrated in Fig. 1. Four half-way dipoles are spaced by one-half wave-length and fed at their centres.

The large-diameter tubing lowers the inductance and raises the capacitance of each dipole. The low Q broadens the response curve and accounts for the very wide band over which the antenna is effective. Use of low-impedance cable eliminates difficulty with voltage loops and leakage. Note that the outer dipoles are fed through cables which are one full wave-length longer than the cables which feed the inner ones. Therefore each dipole is fed in phase.

Power is propagated only broadside to the array. Assume that a wave starts out at some instant from one dipole. It reaches the next dipole a half-cycle later because of the half-wave spacing. At this later instant the second dipole tends to radiate a field which is out of phase with that which has just reached it from the other. The two opposite fields cancel out along either direction of the array. A receiving antenna located broadside to the array intercepts equal power from each of the four dipoles since in this case all currents are in phase. The total gain in the second case is 7 db over that of a single radiator.

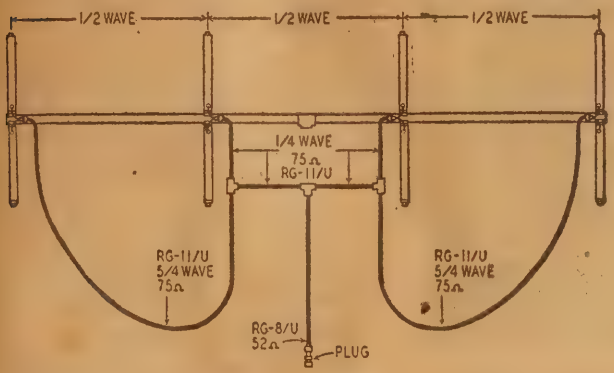


Fig. 1. This diagram shows how the elements are mounted and fed in the correct phase.

POLAR DIAGRAMS

The narrow fields which are possible with the broadside array are shown in Figs. 2-a and 2-b. The first is a cross-sectional view as it might be seen by an observer standing on a level with the array (if radio waves were visible). Little power is lost through upward propagation. The second figure is a view looking down on the antenna.

It should be remembered that the physical half wave-length of coaxial cable is considerably shorter than an electrical half wave-length, something like two-thirds as long. There is a correction figure known as the propagation constant, generally quoted for various types of cable, and this should always be used. Otherwise, the correct length for a half wave must be obtained experimentally.

AUTOMATIC TYPEWRITER

TO avoid that "different" look between the address and body matter of duplicated circulars, a special automatic typing machine has been developed in USA.

The operator types the name and address on the top of the circular letterhead, and then throws the automatic switch. The machine proceeds to type in the body matter of the circular at high speed, being operated from a previously prepared tape.

The result is a circular or form letter which looks exactly as though it had been hand typed throughout.

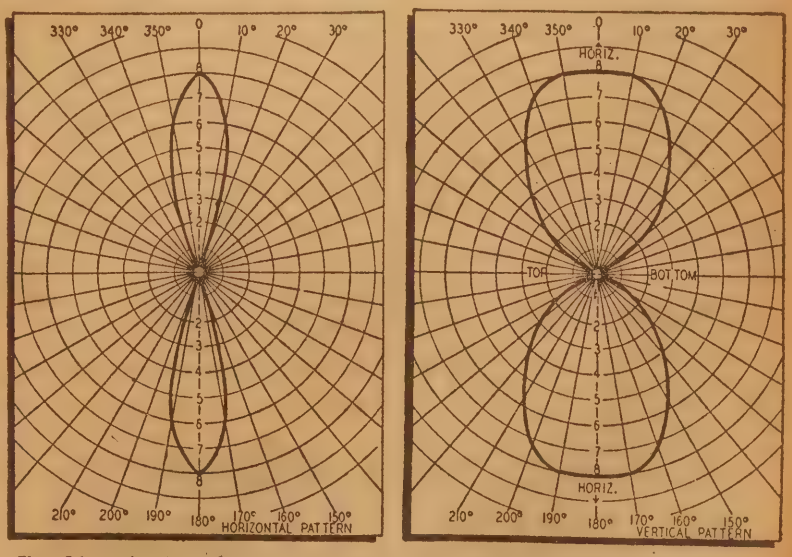
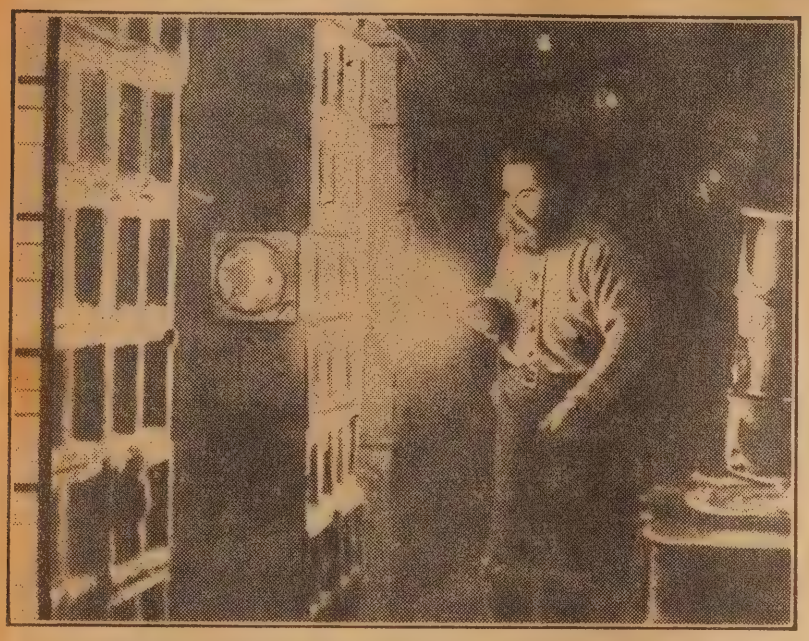


Fig. 2A and 2B: These two diagrams show the aerial polar diagram in a horizontal and vertical plane.

SCIENCE FIGHTS ANTARCTIC COLD



Perfectly preserved stocks of food uncovered where they had lain for years waiting for Byrd's return. This picture was taken during the last expedition.

The recent expeditions to the South Polar regions are vastly different from those carried out earlier by Scott, Shakleton, Amundsen, and many other illustrious explorers. Those were purely expeditions of exploration with the main object of reaching the South Pole. Scientific research played a secondary role, except to a few industrious men who accompanied the expeditions and took advantage of the opportunities offered in one of Nature's most unusual laboratories.

ADMITTEDLY much scientific data of great importance was collected by these men, but their efforts were not organised to any great extent.

Recent expeditions, however, have their origin in the scientific field, with several nations competing for whatever prizes are offering.

The results of the expeditions will probably not be known for some considerable time, and even then the general public will most likely be unaware of what advantages have been gained by them from the expeditions. The effects of information gained will be injected into our daily lives without our knowing whence they came, for the general public is much more concerned with effects rather than causes.

VAST ORGANISATION

The organisation of a modern Polar expedition is no mean task, when one considers the enormous amount of research that is possible.

Instruments and equipment must be carried for investigations into almost every realm of science. Laboratories must be equipped to deal with medicine, biology, geography, astronomy, geology, meteorology, photography, plant life must be studied, the life of the ocean, bird and animal life, food requirements, clothing requirements and a host of other matters too numerous to mention must be provided for while the opportunity offers.

Before any expedition sails great care must be taken to make sure that suitable clothing is available for wear in the frozen Polar region. In this regard, much valuable work was done in an earlier expedition of Admiral Byrd in 1939-41.

The two men responsible for research in this field were Major Paul A. Siple, geographer, and Russell G. Frazier, medical officer.

Now it must be evident to all that one can't just grab one's fur coat and say, "Ta-ta, I'm going for a day to the South Pole." There is much more to it than that, although the discovery by the expedition of a warm oasis in the middle of Antarctica lends color to the possibility of the matter of clothing being a little more simplified.

This oasis appeals to me quite a lot. It seems a sort of "Shangri-la," where one might toddle off with an armful of books, crossword puzzles, and radio parts, and spend a quiet holiday away from the mad mob. Is it possible that the income tax dictator knows of this place? What a thrill it would be to stand on a high green mountain in the middle of this oasis, and watch him struggling towards you up to his ears in snow. But to get back to our subject.

STUDY OF COLD

Before suitable clothing can be designed for the bitter weather, studies must be made of the effects of cold on the human body and the capacity of the body to acclimatise itself.

It is well known that the human body is able to adjust itself to all kinds of climatic conditions. This has made it possible for man to live almost anywhere on the earth as long as he can obtain food, clothing, warmth, and shelter.

Much research has been carried out on the effects of cold on the body in "cold rooms" at some American universities, but no better conditions can be found for experiment than at the South Pole.

When Admiral Byrd's expedition left Boston in 1931 all members of the expedition were living in a temperature around 76 degrees Fahrenheit. A few months later they were living in a temperature of -76 deg. A difference of 152 degrees in a few months. The change was, of course, gradual, and the men could work and live in reasonable comfort.

Experiments showed that continued living in such low temperatures brought about changes in the human body. There were changes in metabolism and red and white blood cell counts. The character of the skin and underlying tissues changed. Blood sugar level altered, blood pressure varied, as also did the pulse and respiration rate. Changes were noted in mental attitudes and cravings for certain foods.

BLOOD COUNTS

Prior to sailing from Boston, a series of red and white cell counts (blood counts) were made. This test was repeated when the Equator was crossed. After settling in at the Antarctic base blood counts were carried out each month. In the summer months the red cells increased owing to the exercise and work in continuous sunlight. The

by Calvin Walters

number of red cells decreased in the winter, owing to the decreased activity, and the effects of the long winter night.

It was found during the 1939-41 expedition that there was a remarkable absence of colds. Only one member of the group caught a cold during the whole period of isolation. A distinction had to be made between a cold and a cough. Coughs were frequent among those whose work took them out of doors into temperatures of -30 degrees. The cough was purely mechanical, but very irritating and developed with the amount of exposure. It invariably cleared up when exposure ceased.

One feature common to men on exposure to low temperatures was the congestion of the mucous membranes of the nose. This was very distressing as the inhaled cold air condensed in the warm interior of the nose and this together with the increased secretion, caused moisture to drip constantly from the nose. Ice accumulated on the face and beard, and taken together these symptoms made it impossible for the men to adequately protect the face and mouth.

COLD ON THE SKIN

Experiments were conducted on the effects of cold wind on the skin. For this a wind-chill index was developed. The velocity of the wind and the temperature was known, and subjects were taken and faced into the wind. The time taken for a frozen spot to appear on the face was recorded, and it was found that some men could face the wind for ten minutes before this frozen white spot appeared, while others froze in from 20 to 90 seconds. Further investigation revealed that those who could withstand the wind for the longer time were those who worked continuously in low temperatures outside. An additional fact discovered was that the skin of these men had become more or less dehydrated together with the underlying tissues. The skin was dry and harsh and the finger nails and hair dry and brittle.

This effect was not injurious to the men but was, as proved later, Nature's method of adjusting the body to cold temperatures. The effect is no doubt due to contraction of small surface vessels and capillaries which makes them less able to be penetrated. A similar effect is noticeable in the well-known "Goose flesh" when one feels cold. This is caused by contraction of the skin.

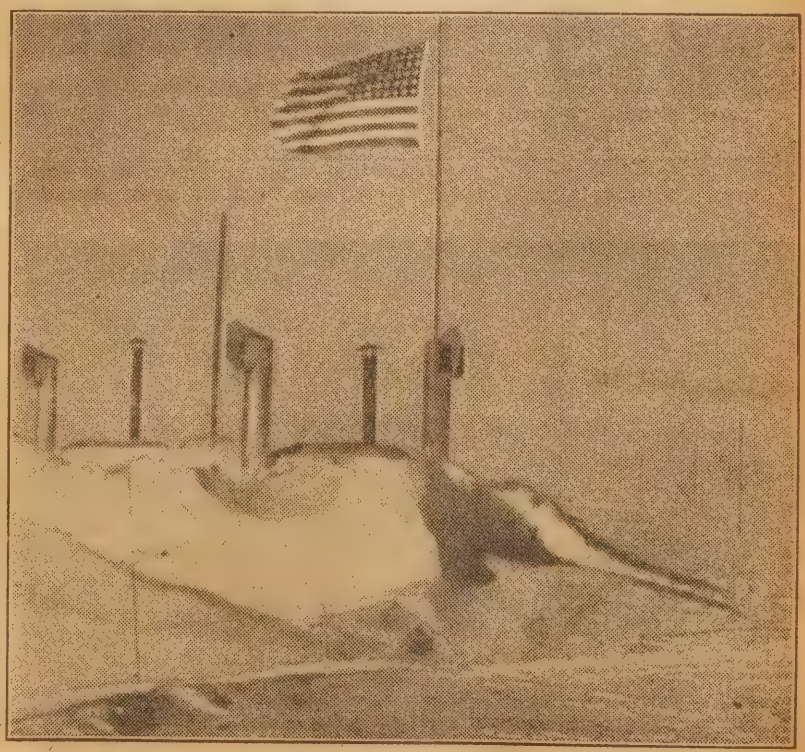
DRY AIR

The atmosphere in the Antarctic is very dry. At 50 degrees below zero the air is dryer than that of the Sahara Desert. This tends to dry out the skin but also to be taken into account is the lessening of perspiration. Perspiration is increased as a person goes into the warmer climates, and this is also a protective measure by Nature, for it would be impossible to live in the tropics without perspiration just as it would be impossible to live in the Antarctic with it, for the greater the perspiration the greater the chance of freezing. Accordingly, therefore, clothing must be adjusted for outdoor workers so that perspiration will not be unduly stimulated.

The dehydration method of Nature for self preservation is seen in most forms of animal and vegetable life in other parts of the world. Some kinds of bacteria continue in existance merely by drying out. Trees and plants protect themselves against the cold by sending the sap down to the roots before the cold weather sets in. Hibernating animals do not take any fluids during the winter period.

Nevertheless, many noses, toes, ears and fingers were frozen during the expedition. The white spots that told of freezing were carefully watched for. When the spots appeared a slight tingling sensation accompanied them. The warm hand applied to the spots for a few seconds usually remedied the matter.

Chopping meat with an axe! Another picture from the recent Byrd Antarctic expedition.



How men live under snow. A modern camp complete with ventilation system is able to withstand the worst blizzard.

SKI-PLANE OPERATES ON SNOW

A Miles Aerovan fitted with skis for use in Canadian snow country about to take off The aircraft performance is normal and it should have many applications in suitable snow-bound country.

FROSTBITE

In spite of precautions some toes and feet and fingers were frost bitten very badly. Treatment for this was massage which emptied and refilled the frozen appendages with blood. This was continued for half an hour. Wet dressings and continuous heat and the elevation of the part for 48 hours or more helped considerably. The finger nails and toe nails always came off.

The old idea of rubbing the affected part with snow was found to be injurious because of the cutting action of the ice crystals in the snow and the fact that the temperature of snow is below freezing point.

Perhaps the most frequent trouble encountered by most men was toothache. Some of this toothache came about in a rather peculiar manner. With the coming of winter the increased cold caused amalgam fillings to contract despite the warmth of the mouth. This, of course, caused the filling to become loose. Some fell out and others leaked and caused decay behind the filling.

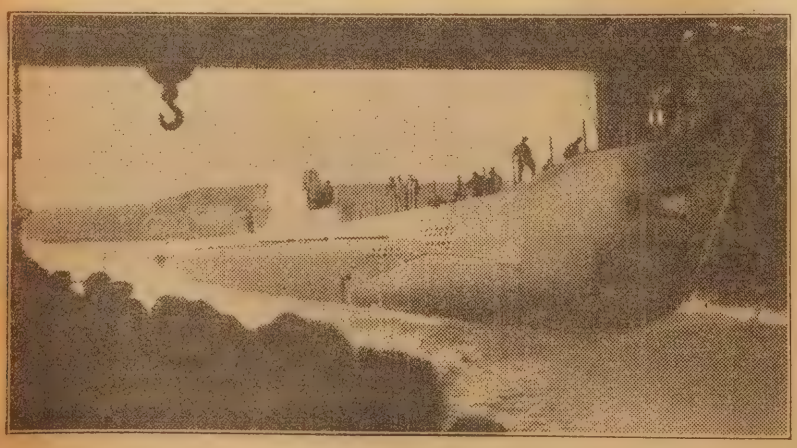
Immediately cold air came into contact with diseased teeth the pain was unbearable. Particularly painful were front teeth with gold fillings.

DENTAL TROUBLE

This was one of the unforeseen troubles of the expedition and no drill or proper equipment was taken on the voyage. Consequently the teeth were filled with all kinds of materials as temporary substitutes, even to red lead and bearing metal. But the results were nil.

Dr. Siple at last discovered a useful filling made by dissolving a plastic he had on board known as "Lumerith." This was used for making rulers and straight edges. Dissolved in acetone, poured into the tooth cavity and held there until dry, it proved a wonderful blessing. When a tooth had to be extracted with the almost primitive means available, an X-ray was taken. The operation is best described in Dr. Frazier's own words. "The patient was given plenty of time to make up his mind and to become 'willing.' After about twenty-four hours in which he would become very friendly, the job would be attempted. By using one half of one per cent. novocaine (local anaesthetic) and taking plenty of time, the extraction would be completed. Fortunately, very few roots were left. All hands turned out for the job, and the cook would brew a pot of coffee in honor of the occasion. The cook, Sigmund Gutenko, CCSUSN, also acted as assistant and proved a very able one."

It will, therefore, be seen that that is at least one lesson that Polar expeditions have learned and no doubt modern outfits include an up-to-date dental clinic.



The modern British submarine "Acheron" being launched at Chatham. Submarines may yet play an important part in the ice regions and have, of course, been used in the past.

ADRENALIN INCREASE

The increase of the secretion of adrenalin by the glands of the body in the cold climate was accidently discovered during these dental operations. It is always the practice to administer adrenalin with local anaesthetics to minimise bleeding. The usual dose of the drug produced adrenalin shock because the increased secretion by the body had already increased the quantity in the blood to almost maximum.

It was found that this increase of adrenalin by the body is an important function of Nature in acclimatising the body to cold. The action of adrenalin is to contract the small arteries and veins and capilliary tubes. This speeds up the blood flow through the exposed skin. It also redirects the blood back into the deeper organs and causes the liver to manufacture more glycogen which in turn is used by the body to make additional heat. The cells are stimulated into greater activity and the small end vessels are contracted which cause the skin and underlying tissues to lose much of their water. Blood pressure is increased and the heart and respiratory rate is slowed.

At the same time, during the long winter night, the individual becomes somewhat "cranky" which can be attributed to this increase of adrenalin.

ADAPTED TO COLD

In order to demonstrate the ability of the body to acclimatise itself to cold it was found that at first during the summer the men at the Antarctic base suffered from the cold. They put on as much clothing as possible, and, of course, were rather uncomfortable. As winter approached, they started to shed as much of their clothing as possible. They had gradually become acclimatised for the reasons stated above and were more comfortable when the temperature was 40 degrees below than when they first arrived in a temperature of 0 degrees.

It was found that men acquired a fresh mental outlook towards cold the more they became exposed to it. They learned how to wear their clothing and how to exercise and breathe. At a temperature of 70 degrees below he can live. In other words, he no longer fears cold. In the second summer

when the temperature was 12 degrees, some of the men worked stripped to the waist and some had to be treated for sunburn.

Increase of blood sugar was noted in every case. This is another way in which Nature steps up the manufacture of heat within the body, for the increase of sugar causes greater oxidisation within the cells, and thus more heat. This in turn, causes the men to demand more fatty foods. These they consumed in great quantities. Appetites increased and all men developed a craving for these fatty foods.

BLOOD SUGAR

It has been deduced from this that the distribution of animals over the earth is controlled by the animals' ability to increase or decrease their blood sugar levels. The cold climate animal stays in that climate because his ability to lower his blood sugar content has been lost while the warm climate animals' constitution is the reverse. He cannot raise his blood sugar content sufficiently to enable him to live in cold climates. The penguins brought back in the "refrigerator" during the recent expedition is a case in point. It will be interesting to see whether these birds will acclimatise themselves in the warmer climate of America.

It will thus be seen that the results to be obtained in the Polar laboratory from research on the human body may have outstanding effects on our own life in tropical and sub-tropical regions.

Perhaps at some future time man will resort to the reason of science in wearing the clothes most suitable to his environment. Perhaps he will shed his tight fitting waistcoat and heavy tweeds and become more like a reasonable "animal" when he learns how to adjust his blood sugar and adrenalin content. Then he can go to his tailor and say, "I have a blood sugar content of 5 per cent. What do you recommend I should wear?"

But as the song says "Mad dogs and Englishmen go out in the midday sun."

SUPER ELECTROMAGNET

PACKING into a space the size of a saucer enough magnetic strength to lift an automobile, a "mighty midget Hercules" magnet has been developed as a tool for probing the unsolved mysteries of magnetism.

Designed by Dr. J. E. Goldman, of the Westinghouse Research Laboratories, the U-shaped electromagnet is capable of exerting a concentrated pull of 4000 pounds, a force strong enough to make possible new studies of how metals react in magnetic fields.

The mightiest dam in the southern hemisphere will soon be constructed in Australia only 70 miles from Sydney in the Warragamba gorge; it will be 380 feet high but only 250 feet long.

★ ★ ★

Scientists of the University of California report the finding of skeletons of men who lived in the Sacremento delta region 4000 to 8000 years ago.

NEWS AND VIEWS OF THE MONTH

Home Construction

IF ever there was a case of thriving despite difficulties, it is the lot of the home constructor at the moment. Industrial troubles and shortage of material affect the manufacturer of radio components almost without exception, as practically everything he requires has been affected either in supply or quality by the troubles which at the moment are upon us.

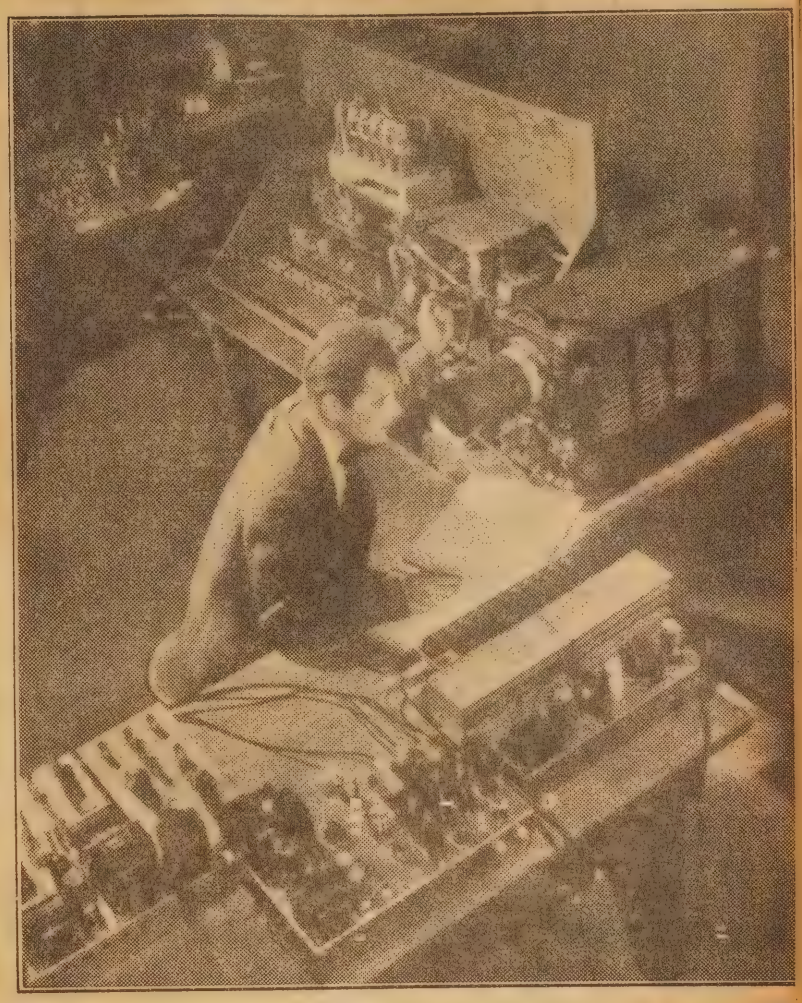
As a result, some of these components are still hard to obtain. In fact, says the would-be buyer of parts, if it's not one thing it's another!

At the same time, things aren't as bad as they have been, although that seems to be largely a matter of opinion according to the items you happen to be buying or selling. It's a great pity, as we know better than anyone what enthusiasm there is at present for building radio gear of all kinds, from the simplest to the most complicated.

DISPOSALS INFLUENCE

THERE are, however, a few bright spots for which we might well be thankful. The amount of quite good Disposals equipment which can be bought, for instance, has provided many with some quite valuable gear. Better still, certain very useful valves have been drastically reduced in price, and we are pretty confident that reductions in other types may be expected. These will not include the standard types as used in the average receiver, but they will include types which can be used just as well by the home builder, if not by the manufacturer, who must standardise at all costs. Therefore, although we deplore many shortages just as much as you do, we are by no means pessimistic about the future. After all, it is the home builder's privilege to improvise, and frequently to get results which cannot be bought in factory-made gear.

TINY ELECTRIC MOTOR.— Made by Mr. Osborn, of Gravesend, Kent, this electric motor, is seen standing on a sixpence. It runs from a torch battery.



NEW MAGIC MATHEMATICAL BRAIN.—T. Kite Sharpless, technical director of the University of Pennsylvania research group which has developed EDVAC, a new electronic magic mathematical brain, operates a working model. The maze of coils, tubes and wires are devices for adding, subtracting, multiplying and dividing. The machine memorises a thousand 10-digit numbers. Devices such as this can solve in minutes problems which would require days of close figuring.

W.I.A. Convention

WE haven't yet seen the report on the recent WIA Convention, but we understand that no real progress was made towards obtaining a Federal constitution to include the Divisions as well as the FHQ. Why this should be is hard to understand. There appears to be no trouble in getting the Divisions to agree that each should operate under identical conditions, one of the reasons being to make easier the work of Federal Council and Executive. And yet the same Divisions and their representatives, apparently will not take the logical step of including this uniform Divisional constitution as part and parcel of the Federal. The only justification for having independent Divisions in this matter would be to allow them to be different. If they are all the same, complete unification of the constitution seems to be the only logical course to take —particularly as this latter point is vital in the welding together of the Institute, whether its members realise it or not. For yet another year to pass

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with no real progress to this end was a mistake. This matter was the only really important point on the agenda. We cannot congratulate you, gentlemen, on your work.

The A.B.C.

THE discussions in various quarters about the ABC, its control, functions and public acceptance, continue. Public opinion on many of these matters appears to be solidifying, even if action concerning them does not. In general, there seems little doubt that the public does not want governmental control of the ABC or any other broadcasting body, it does not want advertising over the National stations, it does not consider a huge expenditure on a National news service warranted, and it does not consider that the ABC has shown up very well in the way it has gone about organising such a service. Someone, apparently, has been ill-advised on the matter from the start, or has shown poor ability in administration. But the public does desire an overhaul of the ABC and its activities, to determine one way or the other as to whether its money is being well spent. This it has a perfect right to do. It is true that the ABC is often subjected to ill-informed criticism; but, unfortunately, when the occasion for airing its linen does arise, many unsatisfactory matters appear which would indicate the possibility of considerable improvement.

There are many cross-currents apparent when the ABC and its control are discussed, with plenty of red herrings and kite-flying thrown in. In the meantime, quite a few good men in the organisation are rapidly becoming "browned off" with the whole business. The sooner vital policy matters are resolved, the better for all.

Bikini Ships Still Radio-Active

US Navy scientists are unable to decontaminate many of the ships used in the Bikini atom-bomb tests last July.

About 20 ships are still dangerously radio-active and cannot be manned or even broken up for scrap.

In the nine months since the tests US Navy scientists have carried out intensive research for a decontamination agent sufficiently powerful to make the vessels safe.

They say that more than 50 fission products might be present on board the ships.

To man the ships would be asking for trouble, and even if they were broken up for scrap, dangerous pieces of radio-active metal might find their way to places where they could harm people.

Scientists expect the contaminated ships to be "hot" for a year to 18 months.

Some of the vessels are in quarantine on America's Pacific coast, others are at Pearl Harbor and other Pacific bases.

RADIOS ARE THE CRAZIEST PEOPLE

"Not all radio cranks are crazy," said the writer of this article as she laid it on my desk, "but it helps. Maybe these words will bring comfort to some other neglected females who imagine they have more appeal than an 807. Or something."

By BETTY SMITH

FOR three years now my boy friend has been what is commonly known as a "radio crank." He's a crank? What about me? He spends nights, weekends, and every available moment in his beloved workshop, and spends fabulous sums on "parts." Don't suffer any illusion that he will ever finish buying parts—he never will.

So, fellow-sufferers—what to do? You "understand" him, you smile sweetly when he starts sawing through a metal chassis, you laugh softly, when he twists knobs and makes a deafening screech—you screech too, have hysterics, and threaten to end it all!

But things finally come to a head over milliamps. You hear him muttering this for weeks, and spends sleepless nights thinking of ways to outshine Milly, only to find she is a technical term.

Finally you purloin a book on the subject, in a desperate attempt to find out all about it.

This book must have been written a long time ago, I think, nonchalantly talking about ohms——20,000 of them a mere nothing. I've discovered my "bed-sitter" is really a microhm, and that if we built one single megohm, the whole housing situation would be solved!

I'm rather perturbed about all the resistors that are needed in building a set. You have to be able to say confidently "I've got a 200,000 ohm resistance." Who wants a fixed resistance? I'd rather have a rheostat, at least it may be varied at will, according to the book.

Do you prefer to wear your close wound coil on the nape of the neck, or perhaps a wire wound or enamel wound one for extra evening glamor? Personally I prefer a honeycomb one—guaranteed to get your Ham.

You have an unlimited choice of "odes"—triodes, diodes, anodes, tetrodes, pentodes and many oders.

Are you in possession of a megacycle? Awfully handy for shopping. If not, why not use horsepower? You haven't got one? S'easy, just buy a couple of kilowatts, multiply by 1 and 1/3rd, and what have you got—a nag. If you buy a car, and don't want the horsepower, just multiply by 0.7 and get your old kilowatts back again.

So Y.L.'s let us leave radio to our O'M.'s. They show a great capacitance for knowledge, excellent characteristics and variable tone control—what am I saying?

About Transmitters

ATOM-SIZE Transmitters of radio waves were described in a report on a new system of radio analysis by Drs. Felix Bloch, William Hansen and Martin Packard of Stamford University. In the new technique the nucleus of an atom is turned into a miniature radio transmitter, sending out a signal that identifies the atom.

Amplified radio frequencies reproduced on an oscillograph screen show the observer what frequency the atom responds to. Each element has a characteristic frequency to which it resonates in a magnetic field under the influence of radio-frequency current.

Test materials are first placed in tiny glass vials in the field of a powerful electromagnet. Spinning the vials in the magnetic field induces a radio-frequency current into the nuclei of the atoms. When the nuclei are spinning at right angles to the field, the frequency of the signal from the atom can be determined by a sensitive receiver, revealing the identity of the element.

The nucleus of a hydrogen atom, a proton, will whirl as fast as 425,500,000 times a second in a powerful magnetic field. Dr. Bloch has been using protons in his testing which has revealed the hydrogen in solution or in paraffin.

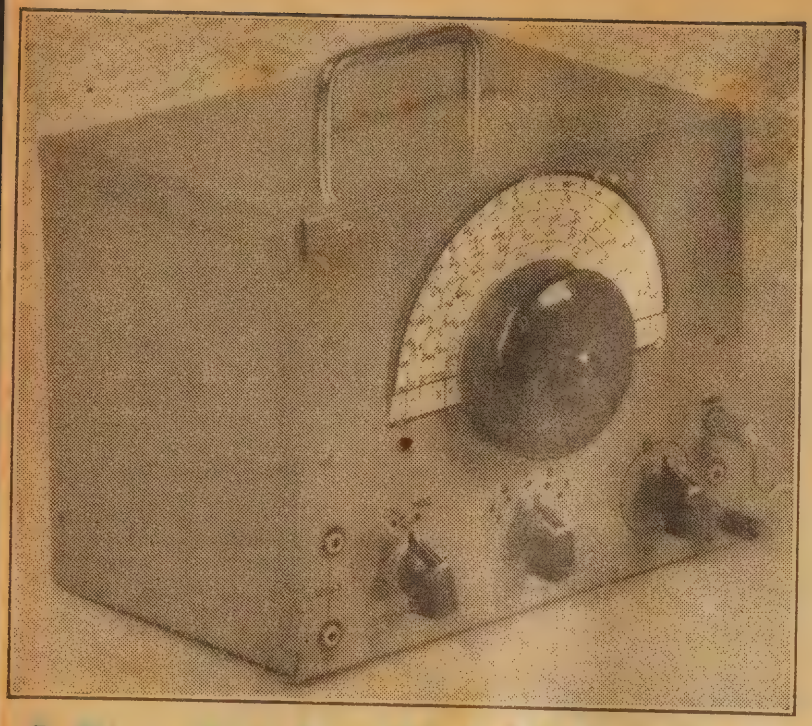
The technique is not yet considered ready for practical scientific work.

This method of analysis contrasts with that in which material to be analysed is bombarded with miscrowaves and absorbs power from the transmitter at the resonant frequency of its atoms. The atoms act as receivers rather than as transmitters in that system.

Goatskins that have to be inflated for each trip support rafts ferrying Chinese across the rivers.

* * *

A new and effective antidote for arsenic poisoning, known as 2,3-dithiopropanol, is reported found.



A front view of the oscillator showing the positions of controls and connections.

Utility with simplicity is still the keynote of this a-c operated oscillator, companion instrument to the battery job described last month. It uses the same chassis and cabinet, but power transformer and rectifier replace the A and B batteries. Band coverage is from 150 Kc to 30 Mc.

AN ALL-BAND OSCILLATOR

a.c. operated version

by W. N. Williams

As we pointed out last month, a good case can be made for a mains operated oscillator for certain classes of work. One instance is on a busy service bench, where the instrument operates more or less continuously every day, without ever being shifted from its position. It is helpful under these circumstances merely to throw a switch and not have to worry about the life of the batteries.

A-C ADVANTAGES

Conversely, mains operation is an advantage where the instrument is likely to be used irregularly. You know the idea—use it every day for a week and then not again for two or three months. This is likely to be the case with a home builder who likes to tear down his set every now and again. Under these conditions, a set of batteries wastes, rather than wears, away.

But it is still up to the individual constructor to choose the type of instrument he fancies. Last month it was battery operation, this month the power mains.

Apart from the power supply arrangements and the use of a mains type valve, the instrument is similar in electrical and mechanical design to the battery job described last month. However, for the sake of completeness, we will repeat in brief our description of the various circuit and layout features.

Referring to the schematic circuit, it is seen that the valve is a 6SN7-GT twin triode, a locally-made type, with separate cathode connections for each half. One triode is used as an R.F. oscillator, the other as an audio oscillator for modulation. The functions could be performed by two separate general purpose triodes, if you have a couple on hand, but the twin tube is obviously easier to instal in the available space.

DUAL VALVE

As in the battery job, we were anxious to use just the one oscillator and modulator valve, and to arrange the circuit so that single untapped coils would suffice. Hence the choice of the Colpitts oscillator circuit. This involves the use of a two-gang tuning condenser, but these are happily in good supply at the moment.

Band switching is a rather obvious requirement if the oscillator is to be convenient to use, so that it is necessary to employ small coils and to group them conveniently around the wave change switch.

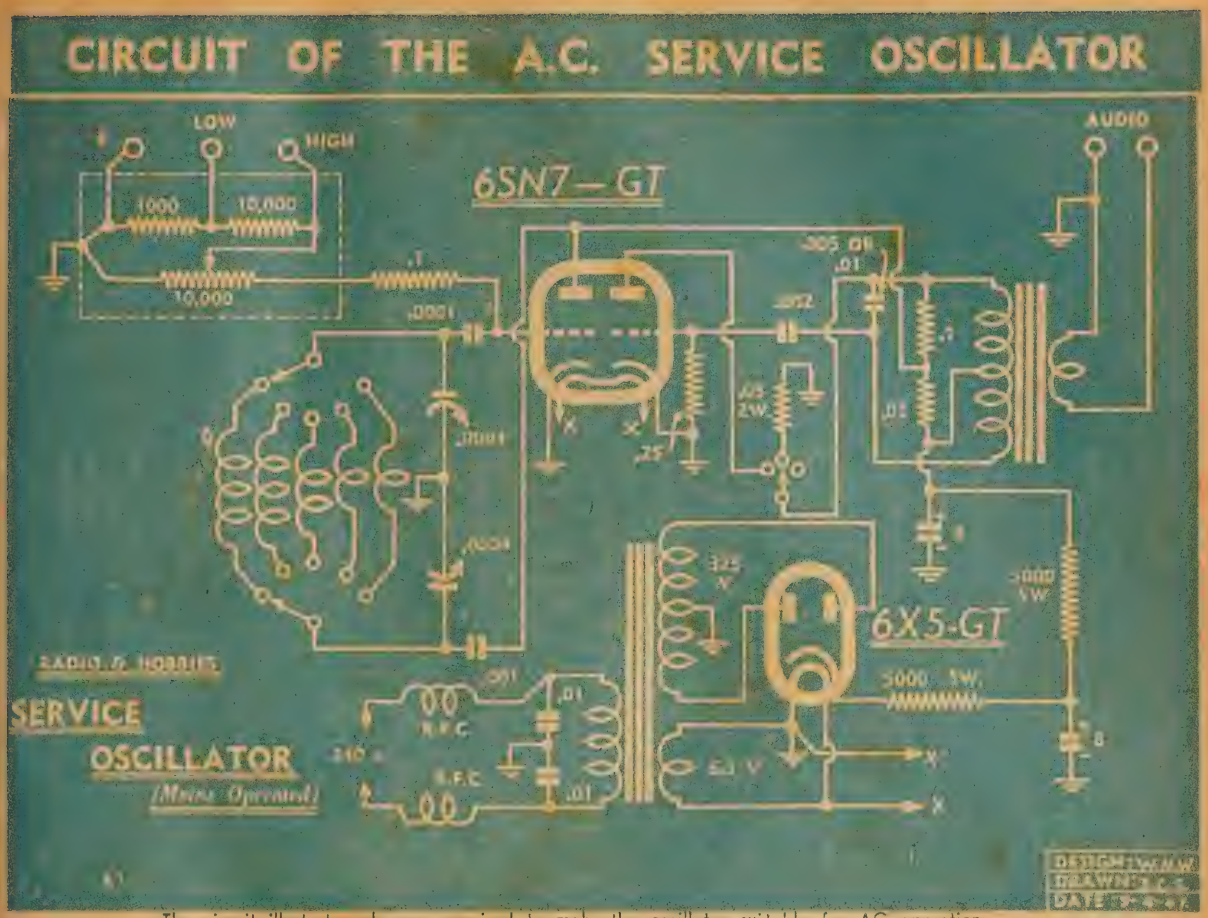
Our suggestion to overcome this difficulty is that you obtain the windings from discarded I.F. transformers and a broadcast coil, winding the two short-wave coils to specifications. The band coverage in the original oscillator worked out very nicely in this way, although it is likely to vary in individual instruments with the particular coil windings selected.

THE COILS

The lowest frequency band can use a coil from a discarded 175 Kc. I.F. transformer, and this should tune from below 150 to about 300 Kc. For the second range, use a winding from a 465 Kc. transformer, which should tune about 275 to 800 odd Kc.

The grid winding from a pie-wound broadcast coil—aerial or R.F. — will tune from below 800 Kc. to about 2100 Kc., thereby covering the rest of the broadcast band and high frequency I.F. channel requirements.

The two short-wave coils can be hand wound quite simply. For the band 3.5 to 10 megacycles, close wind 37 turns of 28 B&S gauge wire on a half-inch diameter former. The range from 10 to 30 megacycles is covered



The circuit illustrates changes required to make the oscillator suitable for AC operation.

by 12 turns of 28 gauge B&S wire, wound on a half-inch diameter former and spaced over ¾-inch. This is at a pitch of 16 TPI. The mounting arrangements for the coils will be discussed a little later.

COLPITTS CIRCUIT

The tuned circuit is coupled to the R.F. oscillator valve through two fixed condensers in the usual Colpitts circuit arrangement. The oscillator grid resistor does not return direct to earth, but connects to the "hot" end of a 10,000 ohm potentiometer forming part of the attenuator output system. This simple arrangement ensures adequate R.F. output from the instrument, with a minimum effect on the R.F. oscillator itself.

The attenuator system is a very simple one, but it does allow good control over the R.F. output voltage. The "High Output" pin jack is connected to the moving arm of the potentiometer, but a subsidiary voltage divider network feeds a "Low Output" pin jack The ratio between the two is 1:10. In some cases it may be preferable to reduce the 1000 ohm resistor to 100 ohms, making the ratio 1:100.

These two resistors should be of the non-inductive moulded variety, and the potentiometer should be a carbon type It is worth making a special effort to obtain the carbon type, if only because its spindle can be earthed when mounting. The usual wire wound potentiometer would require its spindle to be insulated, and some R.F. leakage would occur as a result.

The plate circuit of the oscillator is fed from B-plus through a couple of resistors, which serve to apply a fixed modulation voltage to the R.F. envelope. The resistors are effectively in shunt with part of the tuned circuit, and the loading cannot afford to be increased, owing to the likelihood of rendering the oscillator inoperative at some frequencies.

The normal Colpitts circuit has an RF choke in series with the plate supply, but we found that none of the chokes available were satisfactory over the range from 30 Mc. to 150 Kc. The inductance was generally inadequate for the lowest frequency band, while absorption effects occurred at other frequencies.

The audio oscillator uses a push-pull loud speaker input transformer, tuned by a parallel condenser of capacitance between .005 and .01 mfd.

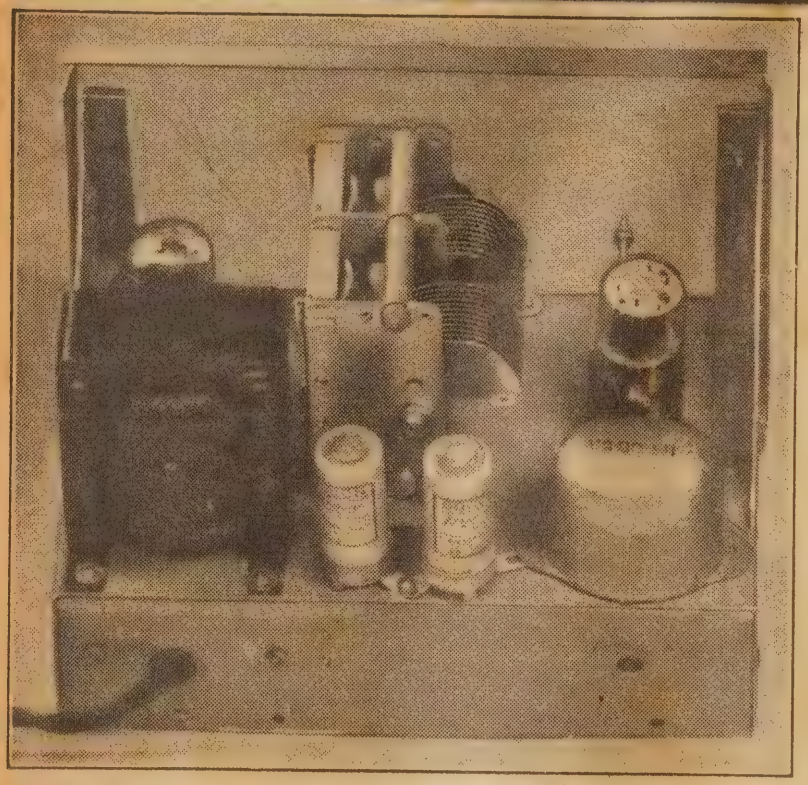
PARTS LIST

- 1 Chassis 8¾in. x 5½in. x 2½in. (steel or aluminium).
- 1 Shield box 9in. x 7in. x 5¾in. (steel or aluminium).
- 1 Front panel with flanges to fit box.
- 2 3in. x 4in. angle brackets (left and right hand).
- 1 Two gang tuning condenser.
- 1 Vernier dial to suit.
- 1 Loudspeaker transformer, push-pull primary.
- 1 325 volt power transformer, (as for "Little General.")
- 1 6SN7-GT valve.
- 1 6X5-GT valve.
- 1 10,000 ohm carbon type potentiometer.
- 1 S.P.D.T. rotary switch.
- 1 2 x 5 single bank wavechange switch.
- 3 Pointer knobs.
- 5 Pin jacks with insulating washers.
- 2 Octal sockets.
- 2 R.F. chokes.
- 2 8 mfd. electrolytic condensers.
- 1 .01 mfd. tubular condenser.
- 2 .01 mfd. (600 v. tubular or mica types).
- 1 .002 mfd. mica condenser.
- 1 .001 mfd. mica condenser.
- 1 .0001 mfd. mica condenser.
- 5 Piston type air trimmers.
- 1 .25 meg. resistor.
- 2 0.1 meg. resistors.
- 1 20,000 ohm. resistor.
- 1 50,000 ohm. resistor, 2 watt.
- 2 5000 ohm. resistors, 2 watt.
- 1 1000 ohm. resistor (carbon type).
- 5 Tuning coils (see text).

SUNDRIES

Nuts, bolts, solder lugs, hook-up wire, tinned busbar, 2 two-position resistor strips, power flex, 1 grommet, scrap aluminium for brackets.

REAR VIEW OF THE OSCILLATOR



Note the addition of power transformer, rectifier, and filter condensers to the original chassis.

The audio note depends on this condenser and on the value of the components in the grid circuit. Some experimenting is worth while to adjust the note to near the usual 400 cycles.

The two resistors across the transformer apply a fixed percentage of the modulator voltage to the RF oscillator, although the actual percentage of carrier modulation will vary according to the R.F. carrier amplitude. This, in turn, is dependent on frequency and the nature of the tuned circuit.

R.F. AMPLITUDE

Some idea of the R.F. amplitude is obtained by inserting a meter between the 0.1 meg. resistor and the attenuator control to measure the oscillator grid current. You can expect grid current figures of between 100 microamps and 600 microamps, depending on the frequency, the coil design, the valve and the operating voltages.

Experiment with the original oscillator showed the variations in grid current could be limited considerably by inserting an unbypassed resistor of a few hundred ohms in the cathode return of the oscillator valve. If you are keen on experimenting various resistor values can be tried out, with or without a bypass, to note the effect on grid current over the whole range of frequencies. Too high a value, however, is likely to render the oscillator inoperative on the high frequency band.

Other measures, such as individual circuit loading, or high tension voltage variation, could have been adopted to hold the RF amplitude more constant, but this would have cut across our expressed intention of keeping the circuit simple. In practice, the variation in RF amplitude and modulation depth is unimportant, as it does not detract from the usefulness of the instrument for receiver alignment.

GRID CURRENT

Incidentally, one may mention that the grid current test is a simple method of making sure that the oscillator is working over the whole frequency range. If grid current is not evident on your 1 milliamp meter at a particular frequency, you can assume that the oscillator is not functioning.

Another point: If you plan to use a valve like the 6A6, which has one common cathode return for both sections, it may be better to earth the cathode direct, since any cathode resistor included for one oscillator will have an effect on the operation of the other.

POWER SUPPLY

The power supply is a simple affair employing a 6X5-GT rectifier and resistance-capacity filtering. The 6X5-GT was chosen because of its small size and lower operating temperature as compared with the 5Y3-G. If the latter rectifier is used, it would be wise to drill a network of small holes in the side of the metal cabinet and immediately above the rectifier to provide some ventilation. This could even be done for the 6X5-GT, but remember we said small holes, not just a couple of very large ones.

In the absence of anything smaller, we used a "Little General" type power transformer, giving 325 volts per side. A 5000 ohm 5-watt resistor connects between the cathode of the rectifier and the first filter condenser, with another 5000 ohm resistor to the second filter condenser. Under the light current requirements of the instrument, this gives just about the necessary 250 volts for the high tension supply.

With a higher voltage power transformer, the d-c resistance value of the first 5000 ohm resistor would need to be increased to maintain the high tension voltage at the required figure. Conversely, a lower value would suffice for a lower voltage transformer. Most constructors building this instrument will have access to a voltmeter so that the selection of an appropriate resistor should present no great problem.

BLEED RESISTOR

There is one other point of note in this connection. For the unmodulated output condition, the audio oscillator is rendered inoperative by opening the plate circuit. This means, of course, that the reduced high tension current drain allows the voltage on the R.F. oscillator to rise. We have offset this by wiring a 50,000 ohm 2-watt resistor to the modulation switch, so that it provides a bleed current equivalent to that drawn by the audio oscillator.

You will find that 50,000 ohms is close to the mark, but, here again, constructors with a voltmeter on hand can easily select any other near value which serves to maintain the high tension voltage constant with or without modulation. We could have wangled some initial cathode bias on the modulator and allowed it to draw current at all times, but this may have led to difficulties for readers desiring to use a valve like the 6A6 with one common cathode connection.

ASSEMBLY

The components are assembled on a main chassis measuring 8½in. x 5½in. x 2½in., with a flanged front panel measuring approximately 9in. x 7in. The photographs and diagrams show just where they all fit in. Some careful thought is necessary before mounting the tuning gang, so that its spindle will be in a position to suit whatever dial is used. The one shown in the original oscillator is a special instrument type which is now available. The scale carrying the graduations must be cut from white card, calibrated by hand and then riveted in place on the panel with a protective covering of celluloid.

However, there is no objection to using any of the older front-panel vernier dials, and drawing calibration curves for each of the frequency bands.

The wiring in the main chassis can be completed to the stage shown in the underneath wiring diagram, after which it is merely a matter of in-

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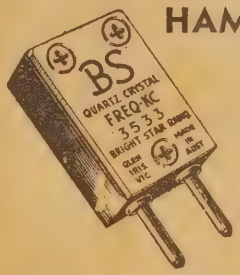

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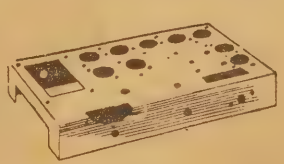

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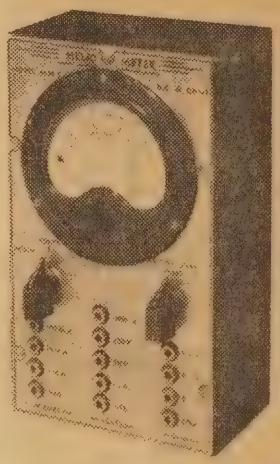

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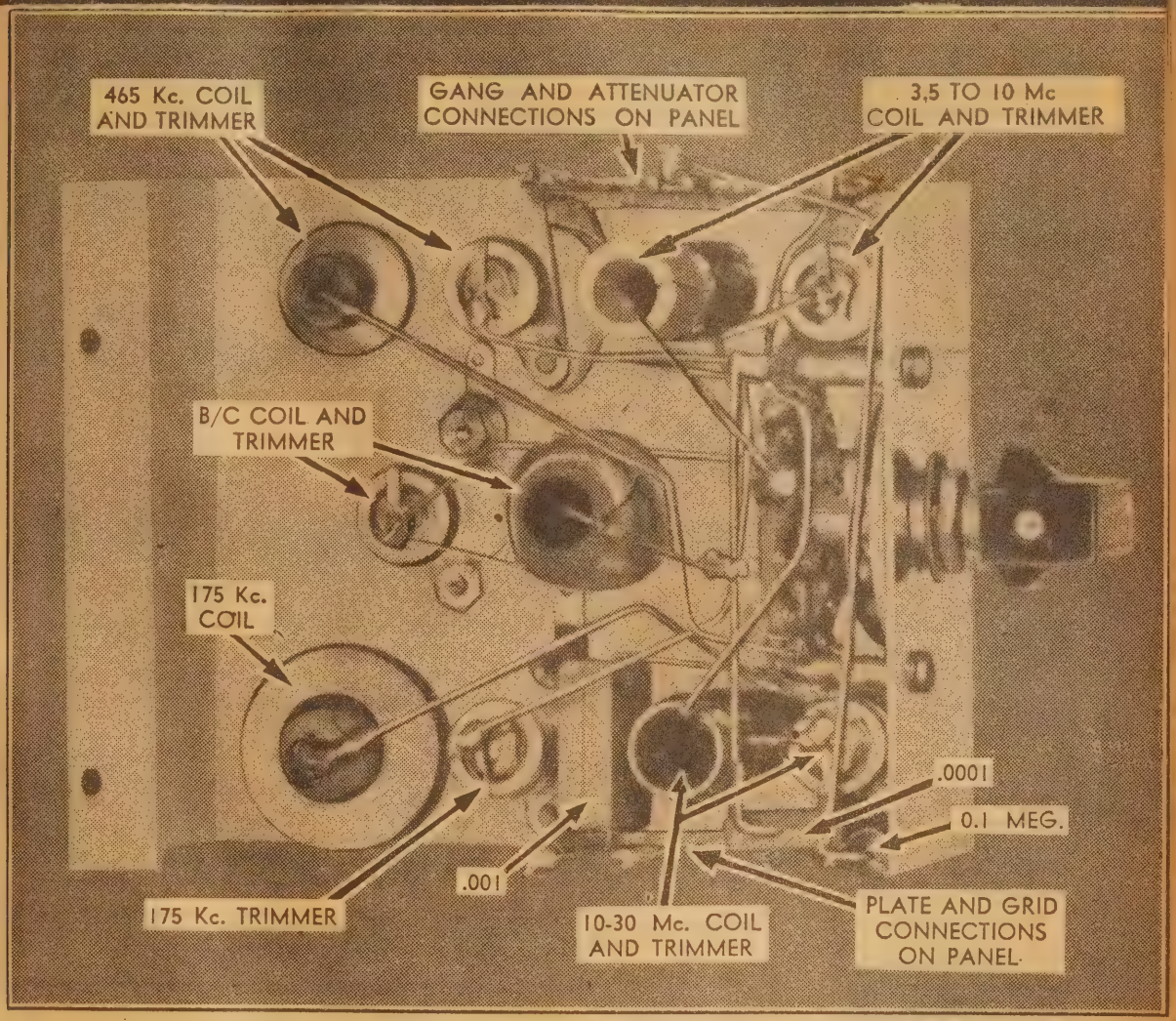
ILLUSTRATION OF COIL UNIT AND COMPONENTS



This is a close-up of the coil unit showing the position of the coils, trimmers, wiring and switch.

stalling the coil bracket, making the few necessary connections and the job is finished. But more of the coil bracket anon.

We made a point of using an upright type power transformer with the leads passing through holes in the chassis straight down to the rectifier socket and filter system. Even if a horizontal type transformer is used, this same mounting arrangement should be followed, so that the rear corner beneath the chassis is left vacant.

Into this corner we have fitted a mains filter unit to minimise the leakage of R.F. signal voltage via the power mains. The two mains leads from the power transformer connect to a pair of R.F. chokes, and the outgoing leads connect to the other choke terminals—one choke in series with each lead. The transformer side of each choke is bypassed to chassis with a .01 mfd 600-volt condenser.

CHOKE MOUNTING

The chokes should be mounted on a small strip of bakelite and care taken to see that there is no chance of the connecting lugs shorting to the chassis, or being pulled out of position by a tug on the power flex. When the components have been mounted in place, bend up a small shield from scrap aluminium and bolt it around the filter network.

The remaining project is the coil unit itself. It is assembled and then mounted into the chassis.

FOLDING

First obtain a strip of aluminium 8¾in. x 3½in. and fold it over three times, as indicated in the photograph. The first fold measuring 1¾in. x 3½in. forms the front of the bracket, while the base measures 3½in. x 4in. The rear section measures 3½in. x 2½in. and the odd ½in. is turned inward to form a flange. Holes should be drilled in this flange so that it is locked in place by the same two bolts which hold the gang condenser bracket.

The original coil unit contained a trimmer condenser for each band which allows for adjustment of the tuned circuits to correspond with dial calibrations. The trimmers are not essential but, if used, they should be of the air dielectric type and wired across the grid side of the tuned circuit. They should be mounted so that the adjustment is accessible through holes in the base plate.

The arrangement of the various coils in the unit is shown by the wiring diagram and photograph, as also are the various connecting leads. It is a good plan to wire the coil unit through out with 20 gauge tinned copper, with 1 mil. spaghetti slipped over it wherever there is danger of a short-circuit.

SWITCH CONNECTIONS

Considerable care is necessary to avoid getting mixed up between the switch contacts and coil connections but you will not go wrong if the wiring diagram is followed out lead for lead. This matter was explained at greater length in the April issue and it would be a good plan to refer to the article in question, particularly to Page 27.

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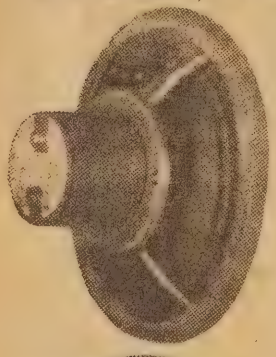

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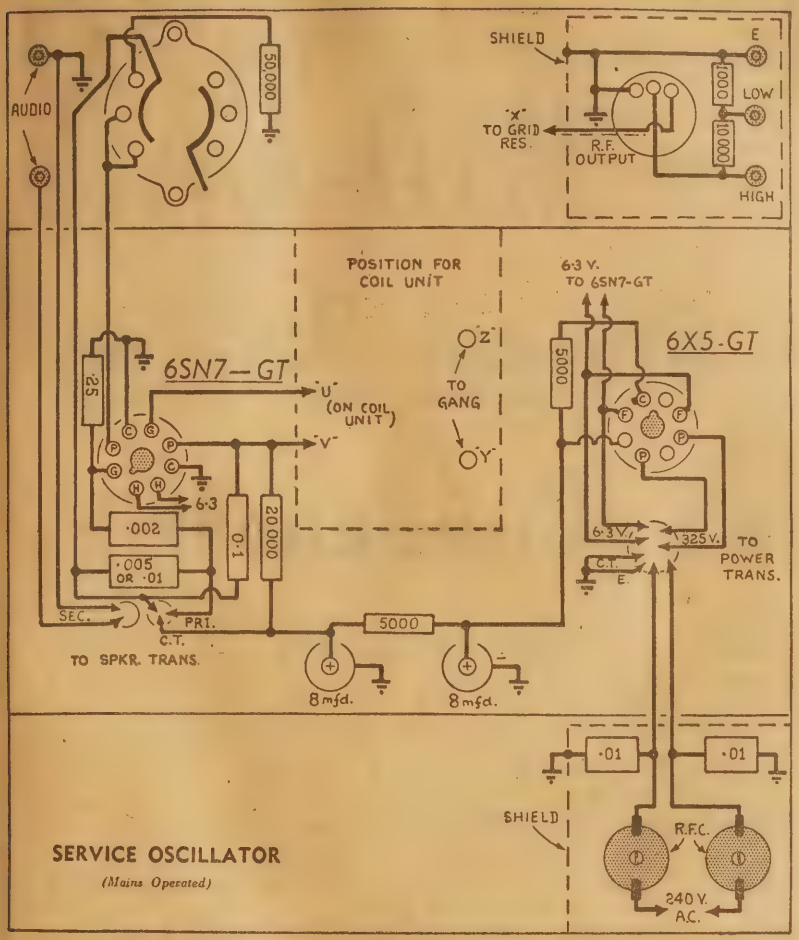
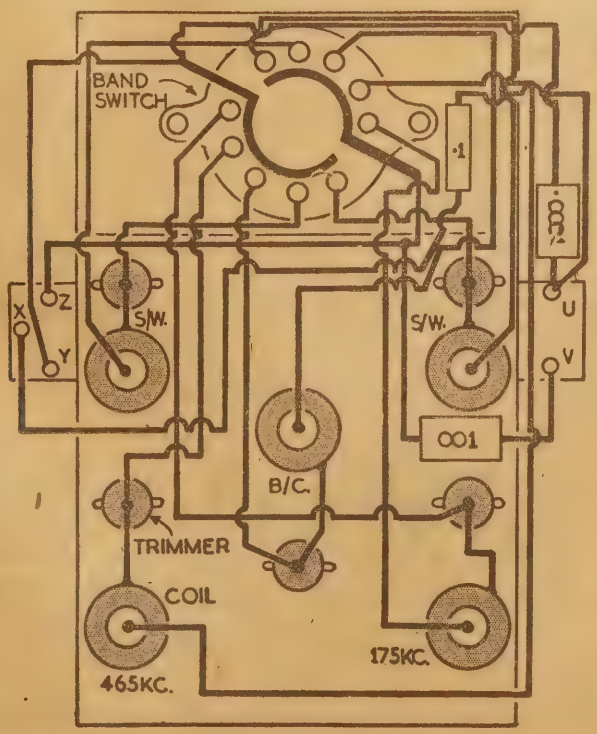
OSCILLATOR WIRING DIAGRAM





The wiring of the coil unit is the same as for the battery version. It can be completely finished as a unit before mounting under the chassis.

The plate and grid coupling condensers and the oscillator grid resistor are mounted within the coil unit and the leads for connection to the tuning gang and the oscillator valve are terminated in two small resistor panels, one to either side of the coil bracket.

When the coil bracket is completed, check over the leads, then slip it into place in the main chassis and connect up as shown in the underneath wiring diagram.

The complete instrument fits into a shield box measuring 9in. x 7in. x 5¾in., which can be equipped with a suitable carrying handle and four rubber feet. Drill a hole in the back to allow the power cord to go straight out from the mains filter unit and your oscillator is complete except for the calibration.

The subject of calibration will be covered in a later article, although many readers will doubtless be able to go ahead and do the job for themselves. However, before you start, make sure that the trimmer condensers are screwed in to between 1-3 and ½ their total capacitance so that adjustment can be made in either direction if calibration tends to change slightly throughout the life of the instrument.

REACTION AND HOW TO CONTROL IT

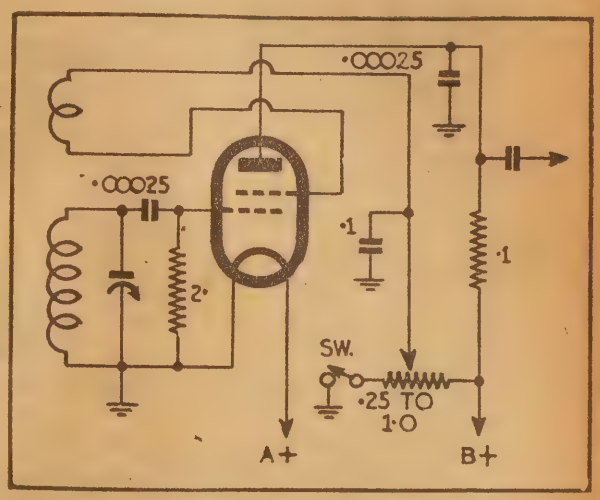
Regeneration, or reaction as it is frequently called, is probably the most important single factor in obtaining results from simple receivers. With it, tremendous sensitivity is obtainable from a single valve. The first part of this article, written for our younger readers, appeared in the last issue.

A rather similar circuit is shown in figure 5. Here, the regeneration is controlled by a potentiometer in the screen circuit of a pentode detector. Once again the potentiometer value can be anything from 0.25 to 1.0 megohm, and it is usually necessary to earth the free end of the control to give full control over regeneration. As in the previous case, some provision is necessary to break the circuit through the B-battery and potentiometer while the set is not in use. The need for this does not apply with a mains or vibrator-operated set, as the high-tension voltage is automatically removed when the set is switched off.

★

This circuit shows how reaction is controlled by varying the screen voltage of the detector. Either a variable resistance, or a potentiometer as shown, may be used.

★



SCREEN REACTION

Back in 1943, at the suggestion of one of our readers, we tested and described several small sets, in which the reaction circuit was installed completely in the screen of a pentode, and this scheme has remained a favorite with us ever since. It works admirably with all standard coils and has always been completely free from lag and "plop" effects.

In connecting up the circuit, the screen connects to the coil lug which normally goes to detector plate, while the other end of the reaction coil goes to the potentiometer.

In figures 5 and 6 we have shown a plate load resistor, rather than an audio transformer. Speaking generally, resistive load is preferable in the plate circuit of a pentode, since it gives better fidelity and gain than a transformer.

The plate load resistor can be anything between .05 and .25 megohm, and the voltage drop across it is such that it is permissible to operate the detector plate directly from the full high tension supply voltage. The higher values of plate load give increased gain, but naturally reduce the effective plate voltage. If in doubt, use the highest value up to a limit of 0.25 meg. which gives the normal regenerative effect.

TAPPED COIL

A favorite circuit overseas, readily applicable only to indirectly heated valves employs a tapping on the grid coil to which the cathode is connected. The phase of the cathode and grid voltages is such that a regenerative effect is obtained and the need for an extra winding in the plate or screen circuit is thereby obviated.

Control is afforded by varying either the plate or the screen voltage by a potentiometer. The scheme can be used with a triode, but it is usually applied to a pentode with screen control. The circuit generally affords excellent control, and is widely used in short-wave receivers.

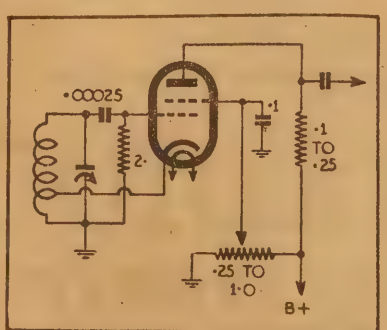
The virtues of a cathode tapping against an extra winding are problematical. The single winding conserves space, but experiment and adjustment to a tapping is a difficult problem.

The tapping is made just up from the earthed end of the coil, the proportion of turns above and below the tapping varying with the frequency band in question. If determining the tapping position experimentally, begin by placing the tapping about one-tenth the way up from the earthed end.

And here are a few remarks by way of conclusion. In figures 1 to 6, we have shown the grid resistor connected directly between the grid and the negative filament pin, which is connected to earth. The grid thus operates with zero initial bias.

An alternative method is to connect the resistor right across the grid condenser, so that the return path to earth is through the tuning coil. The operating bias is not affected by this connection, but some variation in results —for better or worse—is sometimes apparent. Try the two connections for yourself and see which yields best results.

Again, the grid resistor may be returned directly to the positive filament pin, generally with a slight increase in the activeness of the regeneration. Some older receivers even had a 400 ohm potentiometer across the filament circuit, with the grid resistor connected to the sliding arm. Adjustment of the potentiometer affected the fierceness or otherwise of the reaction control. Once again, you can experiment with the grid return to see which arrangement gives the best results.



This circuit shows how the tapped coil is used for cathode connection.

AERIAL IMPORTANT

The aerial and the method of coupling has an important bearing on the smoothness of the reaction circuit. If the aerial is too long, or the coupling coil too large or tightly coupled, absorption effects may prevent the reaction circuit from operating on certain spots in the tuning range.

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NEW EDITION OF COYNE'S ANNUAL

FOR those who may like to spend the long winter evenings poring over electrical and radio diagrams, one can hardly imagine anything more appropriate than the new "Coyne Electrical and Radio Troubleshooting Manual." Its 611 quarto-sized pages are crammed with all kinds of diagrams, interspersed with explanatory matter.

The book is basically a compilation of instruction papers and shop diagrams issued to students of the Coyne Electrical School in Chicago. Reprinted, collated and bound into a single large volume, it provides a wealth of information for home study. A comprehensive general index in the front simplifies the task of locating information on any one subject.

Subjects covered in the book are as follows: Elementary electricity, motors and controls, generators, signals, meters, switchboards, house and auto wiring, diesel engines. There are further sections on electronics, photocell relays, radio receiver testing and service, radio operating, sound systems, television, air conditioning and refrigeration.

Although there is a certain amount of elementary material in the test, most of the subject matter is best suited to readers with some basic knowledge of electricity. The book shows how electrical principles are applied and utilised in the variety of equipment mentioned above.

The manual is available from Associated Trade Journals Coy., Fraser House, 42 Bridge-st., Sydney. The price, £3/19/9, plus 2/- postage.

A HISTORY OF RADIO

ONE of the most interesting and informative books dealing with the growth of the radio art we have read for some time is the "Conquest of Radio," by Donald McNichol, and published by Murray Hill Books Inc., New York.

The author, a past president of the IRE (USA), presents his story from the earliest experiments in electricity to modern applications of radio in its specialised forms. Not only has he told the story in a readable form, but he has gathered a wealth of authoritative history as well. Where necessary he is technical, but never beyond the resources of the average radio-minded reader. He brings home to us the debt we owe to the great names in radio, and distributes impartially credit where credit is due. You will want this splendid volume for your bookshelf.

THE 2JU 60-WATT MODULATOR UNIT

The modulator uses our standard chassis, and has a particularly neat appearance. Input jack or socket at the left, volume control in the centre, and stand-by switch at the right. The modulation transformer is immediately behind the 807's, and the power transformer and choke to the right of the chassis.

Here is an amplifier, originally built for a modulator, but equally suitable as a public address amplifier, which has given over 60 watts of undistorted output. It will fully modulate a transmitter of 100 watts input from a standard crystal microphone. It is perfectly stable and has a negligible hum level.

IN the issues between June and August of last year we published descriptions of some modulator equipment using 807 valves. Their output ratings were about 30 watts, a little more being obtained under overload conditions, which, of course, are subject to the usual reservations applicable to all overloading.

At that time we were interested in a modulator for use with transmitters operating on the 50 watt input ratings, for which purpose such designs were ideal.

30-WATT CIRCUIT

Basically a very simple circuit was used, with a resistance coupled phase changer to drive the 807's. A couple of pre-amplifiers and standard heavy-duty receiver type power equipment completed the job, for which a special modulation transformer was designed and specified.

Now, an output of 30 or so watts isn't very much for a pair of 807's which, if you study the maker's rating, will give a great deal more than this. Under class AB1 conditions, which would, of course, apply to any resistance coupled circuit, the only obvious way to improve on this output is to increase the plate voltage of the valves, increasing the load resistance at the same time, when, with a high tension of about 600 volts, something between 50 and 60 watts would be practicable.

However, this isn't always the easiest way to obtain higher output, particularly if one already has a modulator and wishes to rebuild it with the least possible expense.

REGULATION

To get this higher voltage—and incidentally good regulation of both plate and screen supplies would be called for—a new and special power transformer would be needed. That's not altogether the easiest thing to come by these days. We worked out some figures for high voltage ratings and for a while we were very much intrigued by the idea. But among other things, the need for a special transformer has so far prevented us from doing much about it.

In the meantime the price of the 807's has been decreased to a figure which makes the expenditure of a few shillings on extra gear which can be obtained a better proposition than to hunt for some which isn't in such good supply. Furthermore, keeping the voltage down to a little over 400, which can be obtained from a heavy duty receiver transformer, simplifies filter design and makes condenser failure less likely.

by

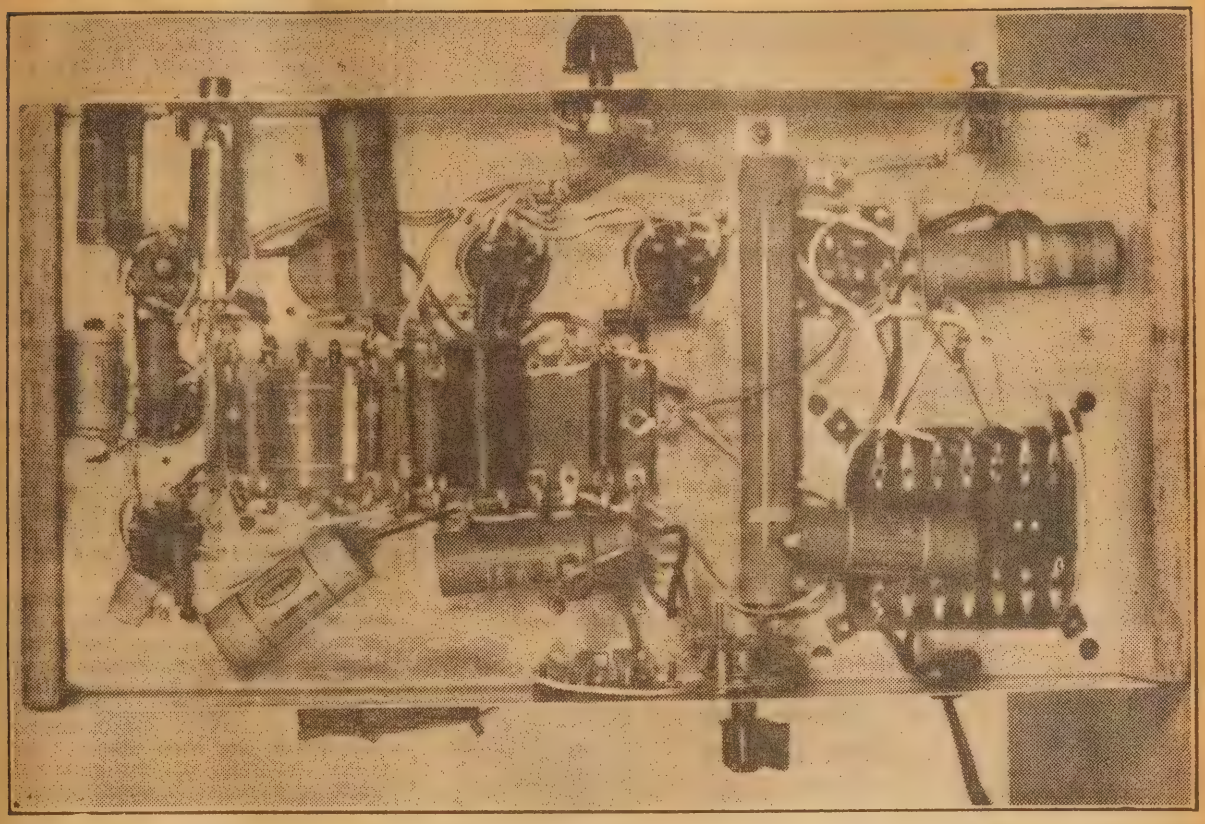
John Moyle

VK2JU

CLASS AB2 RATINGS

With all this in mind we cast an eye over the class AB2 ratings for the 807 and found the figures for a maximum voltage of 400 most attractive. As you will see if you do the same, there is an output rating of 55 watts with 400

UNDER-CHASSIS VIEW OF THE MODULATOR



Most of the resistors and condensers may be mounted on a central strip. Note the suppressor resistors connected to the 807 sockets. The 15,000 ohms bleed resistor is also clearly visible. The input jack at the left has a small cylinder of copper or brass sheet wrapped around it, earthed to act as a shield. A standard microphone plug and socket would be even better, to reduce the danger of R.F. pick-up. The switch at the bottom allows tappings on the modulation transformer secondary winding to be selected.

plate and 300 screen volts, using a load of 3800 ohms.

At this rating the valves will draw a certain amount of grid current, which means that some audio power will be required from the driver to provide it. This drive is not as great as for class B, where the valves are biased back almost to cut-off, and given still greater drive.

However, we cannot now use resistance coupling, as a low grid resistance and a well regulated driving stage are essential. This in turn means that the driver must be something more substantial than a 6C5 triode type, and a transformer coupling will be needed between its plate circuit and the 807 grids.

FOR FULL OUTPUT

Before going further we would point out that the output given is obtainable only if the voltages concerned apply at full output. This means that, ideally, we should have a plate supply which will not vary more than a very few volts with and without signal—bearing in mind that there is a plate current swing on the ratings given of 120 mills. More important still, the screen supply should vary by even less—in fact, it shouldn't vary at all. So that when considering these maximum output figures we must remember they are measured under ideal conditions. As the power supply regulation varies, by so much will we fail to obtain the full output.

There are two further points to remember. One is that we may be able to arrange matters so that the voltage, particularly that of the screens, is a little higher than the figures given, so that if our power supply regulation isn't ideal, voltage will drop to the rated figures when full output is being obtained.

USED FOR VOICE

The other is that on voice transmission we are not dealing with a steady tone, for which all the maker's ratings are given. By providing large capacity filter condensers, particularly on the screen supply, the voltage will not fall very much unless on sustained voice, owing to the "reservoir" effect of the condensers.* It could be said in general that, with this high capacity, we would obtain the full output on voice peaks, which is the main thing we are after. The average audio level on voice is a long way below the maximum obtainable. It is only at or near maximum output that poor regulation is so important.

With all this in mind we can now discuss the operating conditions of this modulator. We have worked out two

PARTS LIST:

- 1 Standard modulator chassis.
- 1 385v, 175 or 200 ma. power transformer.
- 1 80 mA. filter choke.
- 1 50 watt modulation transformer.
- 1 Input transformer for class AB2 807's.
- RESISTORS—1 2 meg, 1 1.5 meg, 1 .5 meg, 1 .25 meg, 1 .1 meg, 1 50,000 ohms, 1 5000 ohms, 1 2000 ohms, 1 500 ohms, 4 100 ohms, 1 15,000 ohms 25 watt. 1 .5 meg potentiometer.
- CONDENSERS—1 .00025 mfds, 2 .05 mfds, 1 .001 mfds, 1 .1 mfds, 3 25 mfds, 3 8 mfds, 1 16 mfds.
- 1 Input Jack or plug.
- 3 9 volt "C" batteries.
- 2 6SJ7 or 6J7, 1 6V6G, 2 807, 1 5Z3.
- SOCKETS—5 Octal, 1 5-pin for outlet, 1 4-pin.
- 1 5 position switch if required for modulation secondary tappings.
- 1 On-off switch.
- Hook-up wire, nuts, bolts, terminal strip etc.

sets of figures—one which observes strictly the maker's ratings at no signal conditions and one which provides for these ratings to apply on full output.

SLIGHT OVERLOAD

In the first case we are in no danger of overloading anything. In the second case we need to run the screens at about 325 volts without signal, so that on full output the voltage will drop to 300. Even so, the only rating we appear to be exceeding is the voltage limit on the screen of 300 volts, which frankly we don't think will cause any trouble at all, particularly as the screen and plate wattage ratings are not being exceeded. We have yet to see the 807 which will flash over or break down with 25 volts "overload" on the screens.

All the figures we shall give here apply to a single power supply using a 175 or 200 mill power transformer with a 385 volt secondary. To have obtained a well-regulated screen voltage two supplies would have been necessary, one for the 807 plates and one for the 807 screens and the driver valves. This would have required a bigger chassis and more expense, which we don't consider warranted for the 50 or 60 watts we hope to obtain.

Using the 300 volt screen voltage, which dropped to 275 volts on full output, and a plate voltage which happened to be 455 volts, dropping to 445 on full output, the measured wattage using a 6600 ohms load and obtained at the secondary of the modulation transformer was 46.25 watts at 3000 cycles. Assuming a transformer efficiency of 80 per cent., which probably is an optimistic figure, this is equivalent to 57.75 watts actually delivered by the valves.

60-WATT OUTPUT

With a 325 volt screen supply, dropping to 300 on full output, and a plate voltage of 445, dropping to 435 volts, the output under similar conditions was 51.8 watts, corresponding to an output from the valves on the primary side of 64.7 watts. All tests on the transformer secondary were made into a resistive load of 10,000 ohms, with sine wave input and output.

The plate voltage shown was that obtained by drawing the 807 plate current straight from the 5Z3 rectifier. It probably accounts for the extra output over the maker's figures. At the same time we are inclined to think that the variations which were made during the war to 807 characteristics may have some bearing on the slightly higher output which was obtained with the higher value of plate load.

In our opinion either of these ratings is perfectly safe to use as far as the valves are concerned. With the higher rating plate dissipation is almost right on the maximum allowable, while the screen dissipation is about 20 per cent. below the limit.

As we said earlier, these are steady tone conditions, and the output given will be exceeded considerably when voice input is being used. They amply justify us in classing this modulator as a 60 watt type, remembering

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A simple kit for a set using an RF stage and regenerative detector, two shielded coils, two trimmers, reaction condenser and two gang condenser are supplied, with circuit.

37/6

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Heater 6.3V 0.2A.
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6J5G

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A high gain UHF penthode 6.3v heater. Ideal for RF stage up to 60mc/s and for F.M. I.F. channels 9 pin British loctal base.

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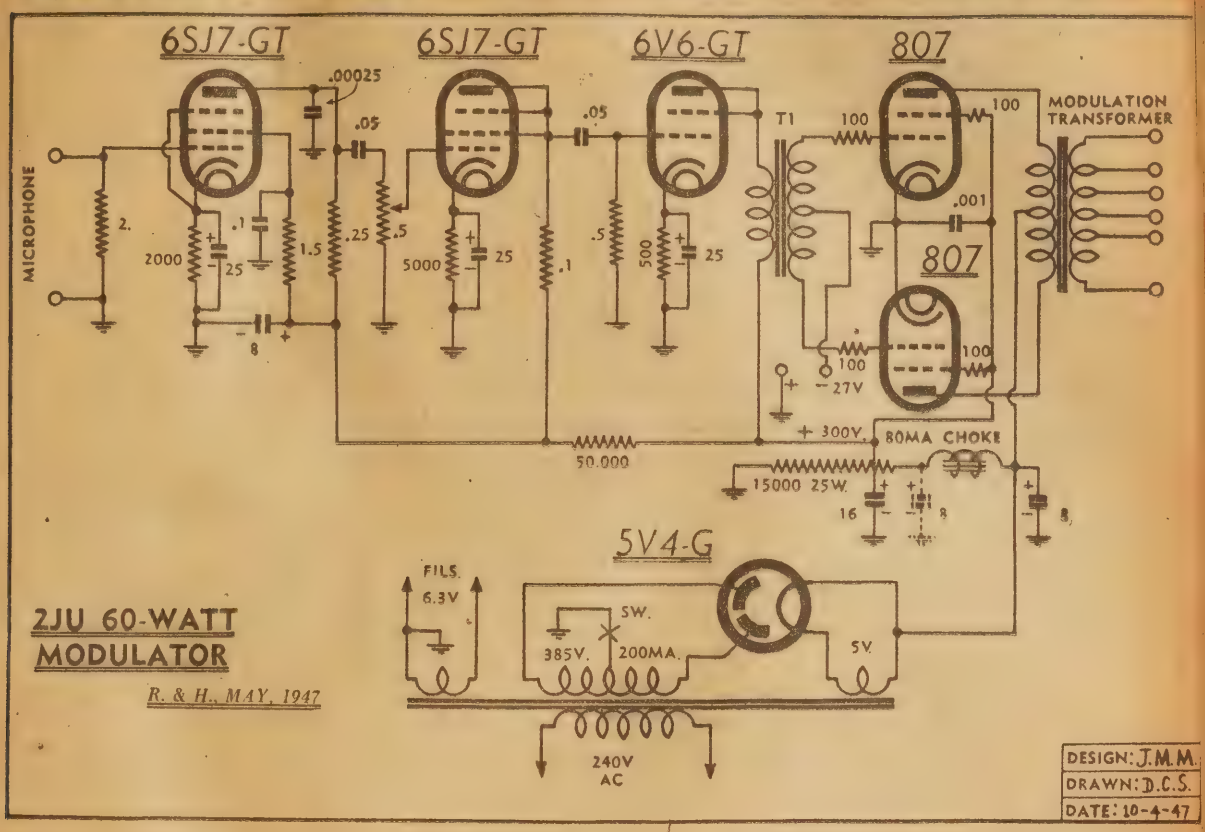
CIRCUIT DIAGRAM OF THE 60w. MODULATOR



The circuit diagram is straightforward enough, and contains no tricks. The 807 plates are fed directly from the rectifier socket. Battery bias is used.

that output ratings are always given on the primary side, whereas our measurements included the transformer losses as would be met with in practice.

BIAS VOLTAGE

Concerning current ratings, the most important thing here is the bias applied to the valves. You will find that a difference of even three volts will have a great effect on plate current, without noticeably improving the output figures. When getting the modulator into action great care should be taken to see that the voltages as shown for the various elements are strictly adhered to.

The job was first built up using a 6SJ7 pentode voltage amplifier, resistance coupled to a 6V6GT as a triode-connected driver, transformer coupled to the 807's. Using a crystal microphone, it was possible to get almost maximum output and impossible to run to distortion.

In order to get the full output, however, we added a second amplifier stage immediately following the pentode, using another 6SJ7 connected as a triode. This allows the modulator to be run right to the limit and to over-modulate a 100 watt transmitter input.

For lower level "mikes" this extra stage will be needed, although it is quite permissible to leave it out if you don't want to push the valves to the limit. It can be added at any time.

The volume control is connected in the grid of the second valve, a precaution against overloading it. However, we found that when the 807's themselves were verging on the overload point the sine-wave output from the 6V6G triode was still perfectly clean, indicating that the preliminary stages were running well within ratings.

Testing for hum on loudspeaker connections we found that the valve noise when "flat out" was louder than what little hum there was, indicating that, in practice, it would be negligible.

The 15,000 ohm bleed resistor is a good thing if you can spare the current of about 30 mills it will demand. It helps keep the screen voltage constant and provides a measure of protection for the 807's if for some reason the driver valve ceased to function in such a way as to allow the 807 screen voltag to rise too high. The lower voltage con ditions quoted here were made with th bleed in circuit and the higher voltag conditions using portion of it as series resistor.

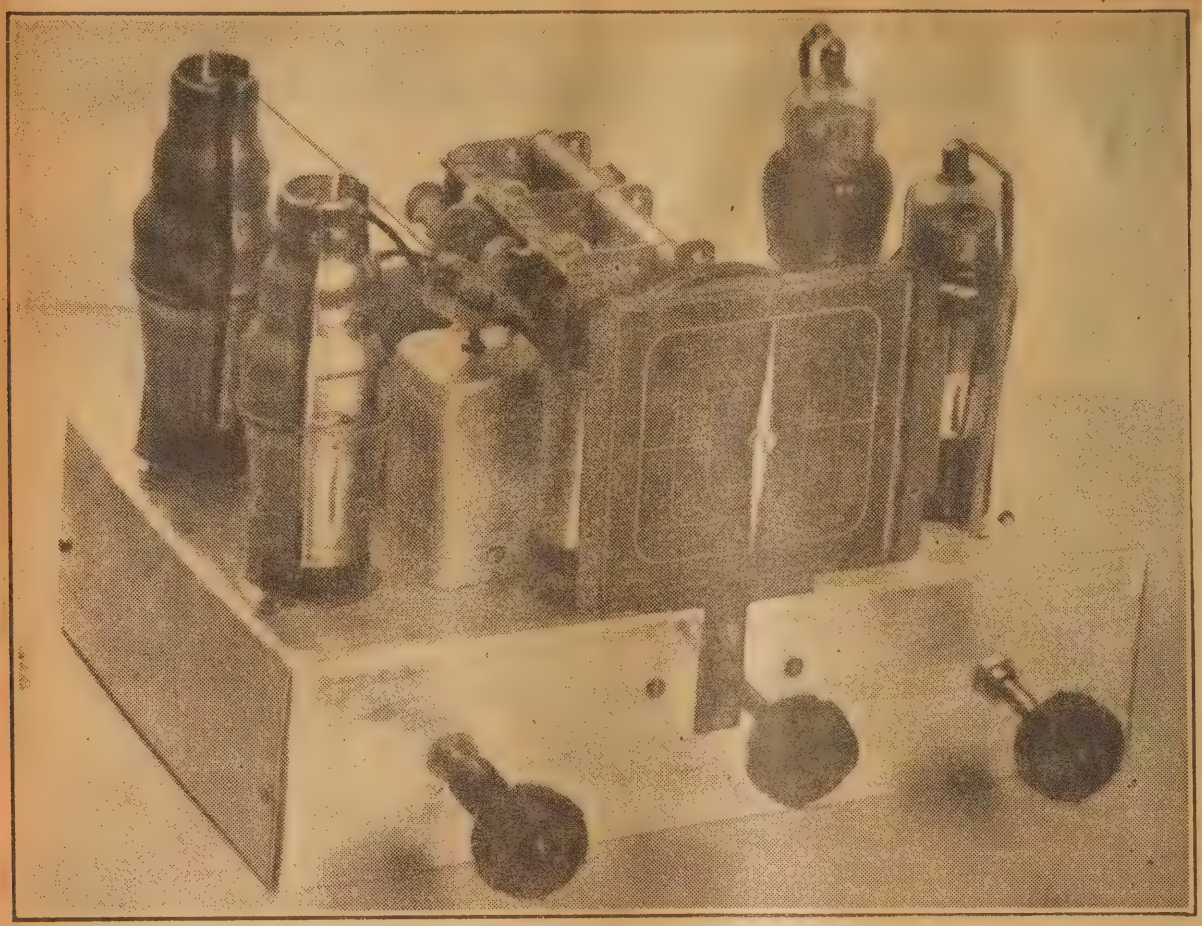
Although we have specified 6SJ valves, the older equivalent, the 6J7(can, of course, be used. In place (the valve wired as a triode, a 6J 6SN7, or any other similar triode ca be used with success. The best rec tifier to use would be the 5R4G, whic is rather hard to obtain at the momen However, the 5U4G or the 5Z3 is quit capable of handling the load.

The modulator should never be oper ated without a load on the modulatio transformer secondary. When test ing, a 10,000 ohms wire wound resisto of about 25 watts or higher shoul be used as a load.

SPECIAL NOTE FOR AMATEURS !

IN the near future we are planning to publish the 1947 edition of the Call Sign Book, the issue of which was, of course, suspended during the war. In addition to a wealth of technical matter of interest to amateurs and SW listeners, it will include lists of all Australian and New Zealand amateur stations. If you wish your call to be included or corrected in any way, please send us as soon as possible your call sign, name, and address, written in block letters in one line. Example:

VK2JU J. M. MOYLE 60-70 ELIZABETH STREET, SYDNEY.



The RF stage and leaky-grid detector are at the left of the chassis, and the audio valves at the right. Ganged tuning is used and reaction allows high sensitivity.

THE 1K5-FOUR RECEIVER

A NEW IDEA IN BATTERY SETS

Among war surplus stocks available to the public have been thousands of 1K5-G valves, most of them sold at a low price. There are still plenty of them in the country, and at least one substantial cut has been made in the list price. This novel and highly efficient little set uses a 1K5-G in every socket, and can really tune them in!

THE 1K5-G is an Australian-designed RF pentode, which has proved its reliability in Army field sets. It has a husky 120-milliamp filament, specially supported to prevent sagging and microphony troubles. It makes an excellent general-purpose triode, where such is required, and can be regarded as the battery equivalent of the popular 6J7-G mains valve.

Knowing that so many of these valves are available, it is natural to consider ways and means of putting them to service. Here is the first example of their use—a four-valve regenerative TRF receiver, which puts up a surprising performance.

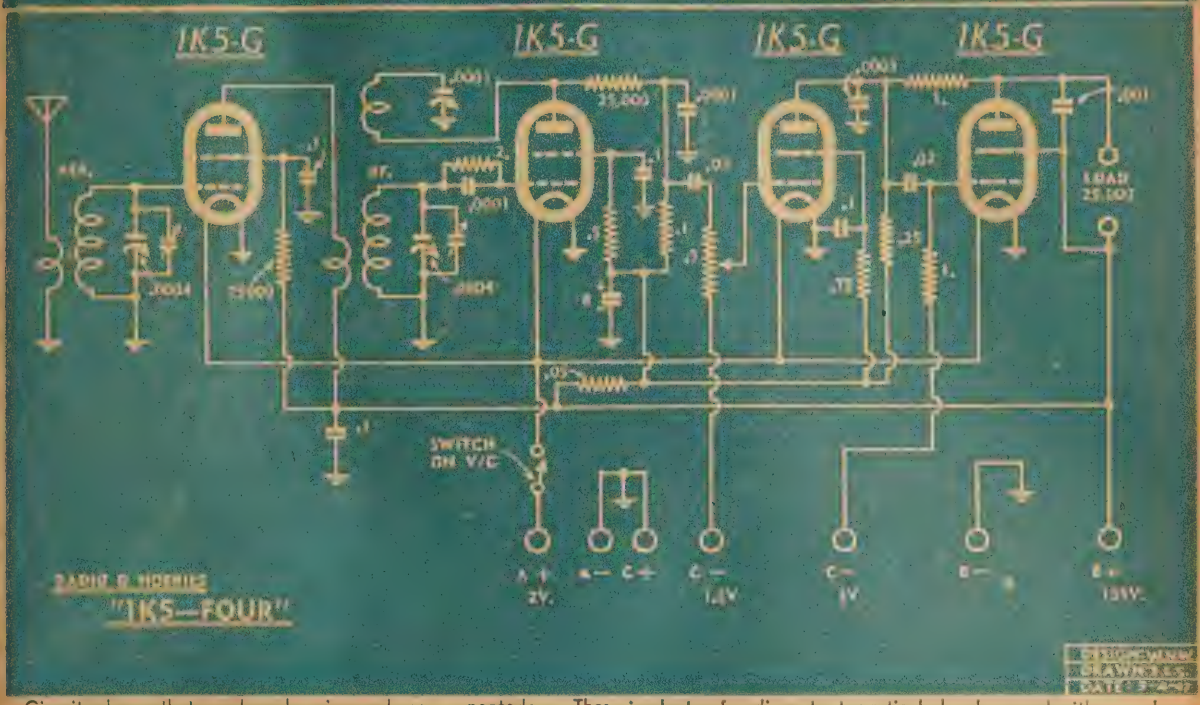
One does tend, in these modern times, to develop a superhet complex and, indeed, our first impulse was to try and evolve a superhet circuit using 1K5-G valves in all stages, including the converter and output positions. While such a scheme would doubtless be feasible, one could expect problems in employing a standard-type oscillator coil, and in achieving some measure of modernity in the circuit arrangement.

Then we recalled the constant requests for a simple TRF receiver, and the dozens of enthusiastic reports about sets like the "All-Wave Battery Three." Our mind was made up. This set would be a TRF job with one RF stage, regenerative detector and a high gain audio system. In fact, we visualised a series of sets progressing from a one-valve job to four or even five valves in all.

Once having made this decision, the rest was only a matter of circuit detail. A suitable chassis was designed for the job, a circuit drawn up and amended as experiment proved necessary, and the "1K5-Four" became a reality.

The set impressed us with its possibilities immediately it was put on test. The reaction and volume controls have to be handled carefully for optimum results—as with any regenerative set—but there was evidence of plenty

THE CIRCUIT DIAGRAM OF THE 1K5-FOUR



Circuit shows that each valve is used as a pentode. There is plenty of audio output, particularly when used with a modern, high-efficiency speaker.

of gain. Connected to a short aerial within our steel-framed building, it tuned in all local Sydney stations, which augured well for its performance under normal receiving conditions.

Selectivity was surprisingly good and power output impressive, considering it does not use a regular power output valve. Now for a run through the schematic circuit.

The aerial feeds into a standard commercial aerial coil, which is tuned by one section of a two-gang condenser. Signals from this tuned circuit are fed to the grid of a 1K5-G serving as an RF amplifier stage. The valve operates with zero grid bias, full high tension on the plate and a screen voltage of about 67 volts, obtained through a series dropping resistor.

GAIN CONTROL

We had planned originally to provide gain control for this stage, but a practical test showed that smoother control over the receiver gain could be obtained more simply in the audio amplifier. Only under exceptional circumstances is the RF stage likely to deliver enough signal to the detector to overload the latter seriously.

The plate of the RF amplifier valve is fed through the primary winding of a commercial RF coil with reaction. Make sure that you buy one with a reaction winding, not just a plain RF coil. It should also be of the same brand as the aerial coil, so that the two will match up as far as inductance is concerned.

The grid winding of this coil is tuned by the second section of the two-gang tuning condenser, thus achieving single-dial control. Trimmer condensers must be wired across each of the tuned circuits and, if not built on to the tuning gang, they must be purchased separately and soldered across the appropriate coil pins or in parallel with each section of the condenser.

In the original set, the trimmers were attached to the gang condenser. The lug connecting to the outer plate and the adjusting screw is soldered to the frame of the gang at a convenient point, and the other lug soldered to the stator plate connection.

The oscillator grid condenser and resistor are also mounted above the chassis, being strung directly between the appropriate tuning gang section and the top cap of the 1K5-G detector.

We thought a good deal about the circuit for the detector. It could have been connected as a triode, tying the screen directly to the plate pin and omitting the screen feed resistor and

PARTS LIST

1 Chassis, 10" x 6½" x 2½".
1 "H" type two-gang condenser.
1 Tuning dial (EFCO type CD/17 or similar).
1 Aerial coil.
1 R.F. coil with reaction.
1 .0001 mfd midget reaction condenser.
1 0.5 meg potentiometer with "off-on switch.
4 Octal sockets, 1 6-pin and 1 4-pin.

CONDENSERS:

1 8 mfd.
4 0.1 mfd tubular.
2 .02 mfd tubular.
1 .001 mfd mica.
3 .0001 mfd mica.
2 Trimmer condensers (if not fitted to gang).

RESISTORS:

1 2.0 meg, 2 1.0 meg, 1 0.75 meg, 1 0.5 meg, 1 0.25 meg, 1 0.1 meg, 1 75,000 ohm, 1 50,000 ohm, 1 25,000 ohm.

VALVES.

4 Type 1K5-G.

SPEAKER:

5" to 10" permag. fitted with 25,000 ohm input transformer.

BATTERIES

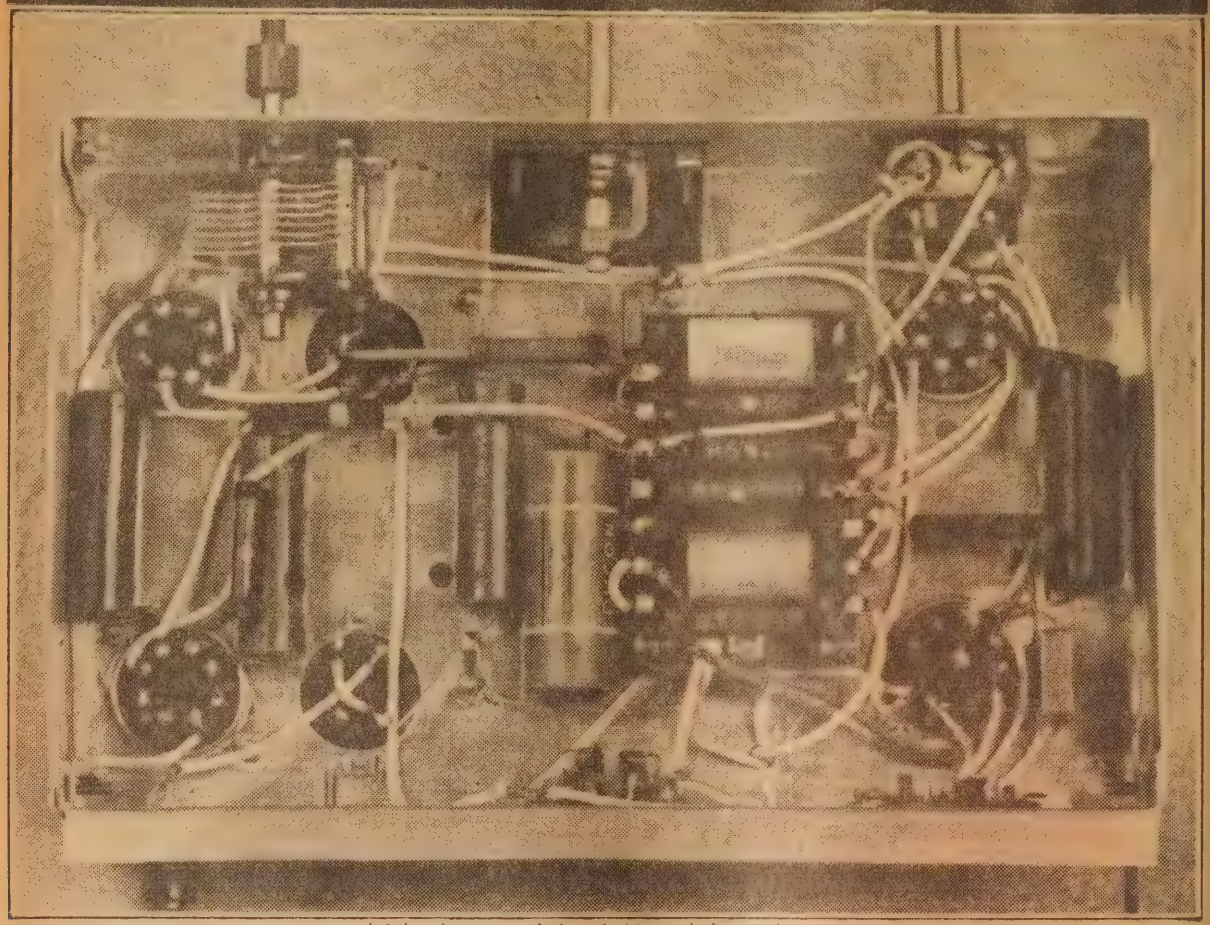
3 45-volt or two 67½-volt.
2 1.5-volt torch cells or 4.5-volt "C" battery.
1 2-volt accumulator.

SUNDRIES:

2 Terminals with insulating washers. 4 grid clips. 6-pin battery plug. Hook-up wire, tinned copper, spaghetti, resistor panel, nuts, bolts, etc.

FOR SIMPLICITY AND ECONOMY

HERE IS THE WIRING UNDER THE CHASSIS



The reaction condenser is at the top left-hand corner of the chassis, and the combined volume control and switch at the right. Most of the small components are mounted on the strip in the centre of the chassis.

bypass. We also considered using screen grid reaction and potentiometer control. Both schemes are excellent, but the potentiometer control generally necessitates an extra section on the "off-on" switch to remove the bleed current from the battery supply when the set is not in use.

Ultimately we elected to operate the valve as a pentode for maximum gain, using the conventional condenser control for reaction. This, of course, means that the audio gain overall is very high and more than ordinary care is necessary to filter out the RF from the audio amplifier to prevent trouble with howling.

After some experiment we found that better results were obtained, especially at the lower frequency end of the band, by replacing the conventional RF choke in the detector plate circuit with a 25,000 ohm resistor. There is room for experiment here. You can try the resistor alone, or a resistor and choke in series, or a good multi-section choke alone. Quite a lot will depend on the type of tuning coil used.

In some cases it may be desirable to bypass the plate of the detector direct to chassis with a 50 or 100 mfd. condenser—a good scheme provided it does not put the detector out of oscillation at the low frequency end of the band.

Another factor which can complicate matters is the natural resonance of the high impedance primary fitted to most modern coils. If the primary happens to resonate in the band, it may completely upset the reaction circuit and control at the low frequency end of the tuning range. If you suspect this trouble, try bypassing the RF plate to B-plus with a 50 mmfd. condenser or, more simply, try shielding the plate lead of the RF amplifier valve.

GRID RESISTOR

The oscillator grid resistor is shown as 2.0 megohms, which is a good, all-round value, but experiment with individual sets may indicate slightly improved results with higher or lower values. Likewise the series screen resistor may be increased from 0.5 megohm to 1.0 megohm, or more if the reaction is too fierce in its operation.

Don't be discouraged by thought of these experiments. Nine chances out of ten, the set will work like a charm exactly as shown in the circuit, but the amendments mentioned represent the normal bit of "plus and minus" when it comes to getting the very best out of a regenerative detector. And the best is certainly worth trying for.

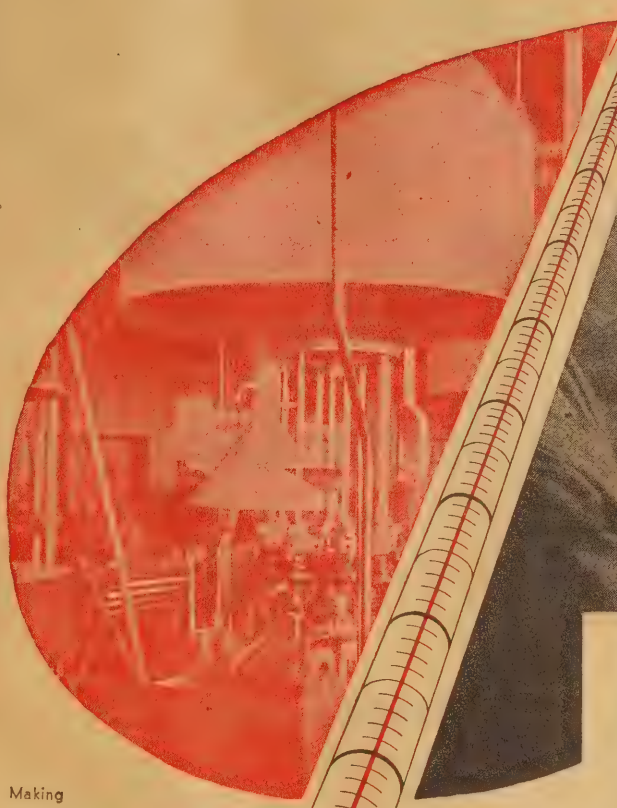
The detector plate and screen resistors return to a decoupling network which is common with the plate supply of the audio voltage amplifier. This decoupling network, involving a .05 meg resistor and an 8 mfd. condenser, is necessary to prevent motor-boating.

A 0.5 meg volume control is included in the grid circuit of the audio amplifier stage to permit adjustment of the audio gain. The set can be operated under the best conditions of selectivity by keeping the reaction control just below the point of oscillation, and setting the audio gain for the required output. Note that the leads to the hot end of the gain control and from the moving arm to the grid should both be shielded.

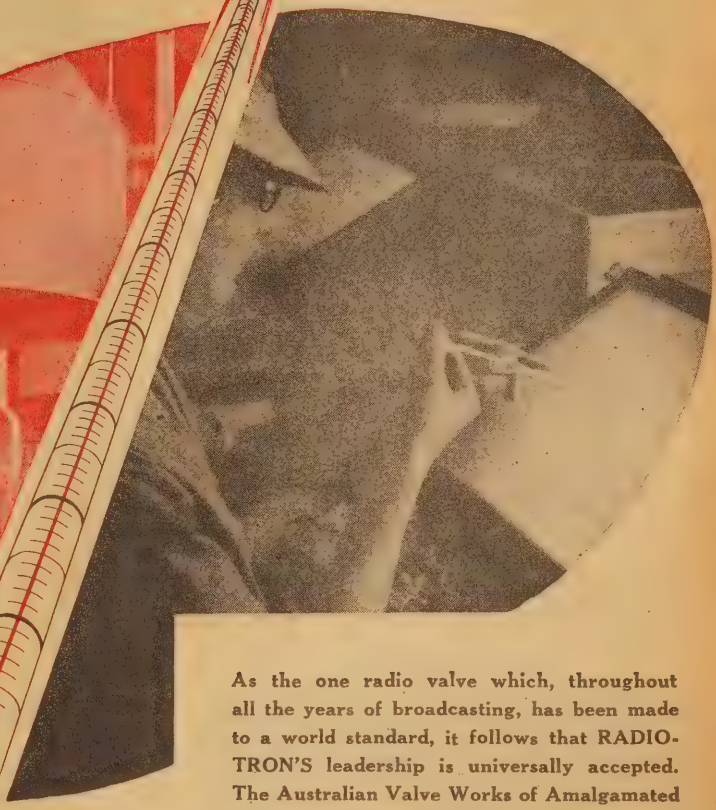
The plate and screen circuits of the audio stage are quite conventional and the output is coupled to the grid of the fourth 1K5-G, operating as an output pentode. The valve is not intended primarily for this class of service, but a check on its characteristics showed that useful power output could be expected with a plate and screen voltage of 135 volts and operating into a 25,000 ohm load. When the receiver was ultimately put into operation the out-

COMMENCING with our next issue, we hope to run a series of articles showing how to build this receiver, step by step. Thus it will progress from a one-valver to a four-valver in easy stages. If you are thinking of learning radio construction the logical way, look for the first article next month.

THE BAROMETER OF WORLD OPINION



Making
Glass flares
for radio valves



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flares over an
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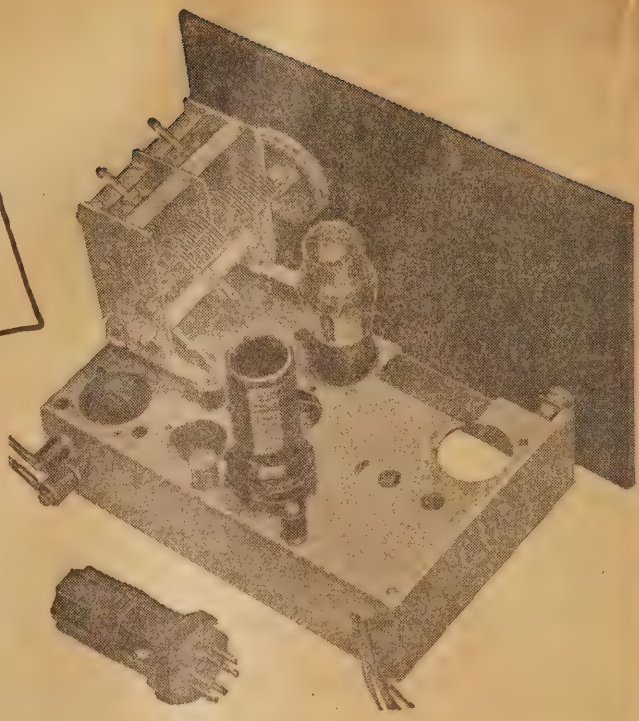
How To Become A Radio Experimenter



1-Valve KIT-SET For Beginners

Radio students and radio hobbyists, experience the thrill of logging near and distant radio stations on a radio set built entirely by yourself. Build your very first set from the Electronic Parts 1-valve kit-set, designed specially for those starting experimental work. It is battery operated and designed for both Broadcast and Short-wave reception. Full details of coil winding, how to mount the parts, method of wiring, etc., given with every kit. Furthermore, this set uses a standard 4-valve chassis, 2 gang condenser, and modern dial which can be used in bigger circuits if you wish to build them later on. It comes to you complete with valve, all material necessary to build the set and wire the coils, headphones, batteries, and everything right down to the last nut and bolt, for the exceedingly low price of **£6/18/-.** Postage in N.S.W. 5/- extra—other States approx. 7/6.

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Here is a complete Electric Soldering Outfit ideal for the Radio experimenter, and also the Professional radio serviceman. It comprises 1-60 Watt soldering iron available either for 240 volt, 32 volt or 110 volt operation, quarter pound of Resin Cored solder, and one tin soldering flux. The complete outfit costs you only **£1/10/-.** Postage 1/6d. extra.

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Are you interested in Test equipment of any description, kits of parts for multimeters, oscillators, etc? If so, write to us for full details. We stock all radio replacement parts. Our Trade repair department will give you prompt service on repairs to speakers, test equipment, meters, radio receivers, pick ups, amplifiers etc.

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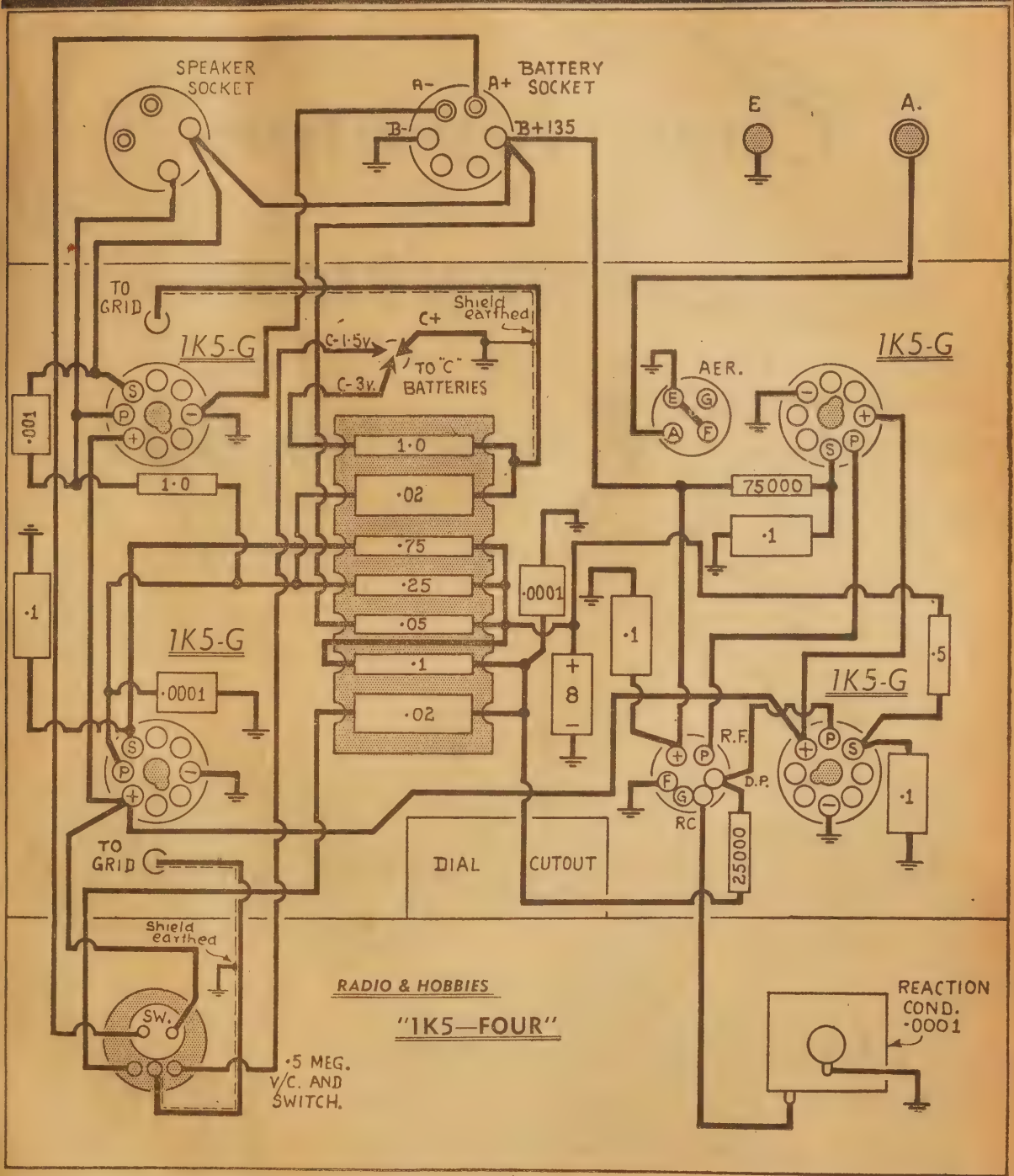


As you see, there are no difficult features about the set, which is particularly easy to build.

put into a 6in. to 10in. loudspeaker exceeded our expectations and was ample for ordinary listening requirements in a quiet room.

GRID BIAS

A grid bias of about -3.0 volts is necessary for the valve under these conditions and it was provided, at the outset, by means of a back-bias network. In view of the fact that only three volts is necessary, we decided to clip two torch cells to the chassis which provided bias for both stages.

The 1.0 meg. resistor connecting between the plates of the last two valves provides a measure of negative feedback which helps the 1K5-G output valve to do a better job.

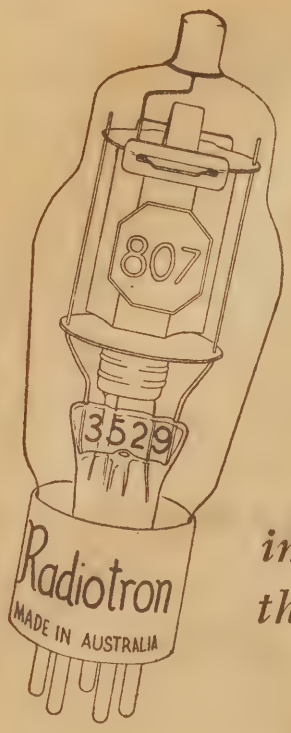
If adequate power output is required for loudspeaker reception, it is desirable to operate the set from the full 135 volts high tension supply. The current drain is moderate—approximately 10 milliamps—so that it would be quite feasible to use small 45-volt batteries. Alternatively, two 67.5-volt portable batteries would do the job.

The set will certainly operate on lower voltages, but with much reduced audio power. With an operating voltage of 90 volts or less, the bias on the output valve could be reduced to -1.5 volts and on the preceding valve to zero.

As a matter of interest we tried operating the set from a 1.5 volt fila-

(Continued on Page 76)

Experimenters Amateurs—



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The Power Valve with a Universal Application

NOW *available for immediate delivery at the attractive price of* **14/6**

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also *use the type 1K5-G pentode in your battery receiver design experiments—for r.f. and i.f. stages* **11/9**

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Administration: 47 York St., Sydney ——— Manufacture: Parramatta Rd., Ashfield.

A NEW METHOD FOR MAKING RECEIVERS

Recently, the meeting of the British Institution of Radio Engineers had the largeset attendance possible when Mr. J. A. Sargrove, one of Britain's leading experts in the electronic field, read a paper describing his new Electronic Circuit Making Equipment, known more shortly as "ECME." By means of this system it is now possible to produce special radio sets at the rate of one every twenty seconds.

By IAN COX

THE average man with no radio engineering background is normally observant enough to appreciate that his radio receiver is a device built up of a number of dissimilar prefabricated parts, varying in intricacy from an ordinary piece of wire to a thermionic valve. He will appreciate, too, that many thousands of processes must have been completed after the manufacture of these parts before the radio set he sees came into being—processes not only concerned with assembly but with testing at various stages to ensure that various components are still sound, and wiring correct.

The novelty of Mr. Sargrove's "ECME" is that it employs mechanised production methods to the full and at the same time is subject to automatic electronic control so that, as well as the complete circuit arrangement and components of the set being produced automatically, automatic electronic testing is carried out while this is going on.

As an example of the method, the special radio set at present being manufactured may be taken. Basically, it consists of two "insulated plates," the cabinet and a very few ancillary parts (valves, loudspeaker and electrolytic capacitors), which are not automatically produced. The principle of the method is deposition of metal and graphite in grooves in the plates and cabinet. This, of course, presupposes a most intricate and accurate design beforehand, but I intend at this minute to give only an indication of the general method of production, and therefore will begin by considering the manufacture of the insulated plate. This in a normal set is little more than a supporting device, but in Mr. Sargrove's set it also forms the dielectric of the capacitors and is, therefore, an integral part of the circuit and predetermines the characteristics of other elements. The plate is moulded in plastic material and its structural form is so designed that when fully processed it contains the inductors, capacitors, resistors, potentiometer, track terminals and conductor paths. All of these are inter-related and inter-connected; they are "grown," as it were, on the original insulating plate in a continuous chain of electronically controlled automatic processes.

Let us follow the processes rapily through from one chamber to the next in "ECME." The insulated plate arrives ready moulded to the required design with grooves and depressions on both sides. First of all, surface moisture is dried off by irradiation of infra-red rays. The surface of the plate is then roughened with abrasive grit so that molten metal will stick to it, and then cleaned. In the next chamber this molten metal is sprayed on both sides of the plate by electronically controlled pistols. The next process is milling, conducted at a high speed with diamond-cutting tools, which gradually remove the metal from faces of the plate and leave it only in the grooves and depressions of the moulding. This is the first stage in "growing" the circuit on to the plate and it is tested automatically in the machine before being allowed to pass on. Plates with

(Continued on Page 75)

USED DISPOSALS EQUIPMENT

R.A.A.F. I.F.F. SETS

LESS TUNING GEAR

This set contains the following useful parts

VALVES

6—6SH7 Type H.F. Penthode
2—6H6 Type Twin Diode
2—7193 Type H.F. Triode To 300m.c.

GENEMOTOR

With Attached Blower, 18 Volts input 450 Volts Output.

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1—4 Pole Single Throw
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OCTAL SOCKETS, RESISTORS, CONDENSERS, ETC.

£3/17/6 F.O.R.

No. 11 TRANCEIVERS

Complete, other than connecting leads, directions for connecting supplied. All these sets in good working order.

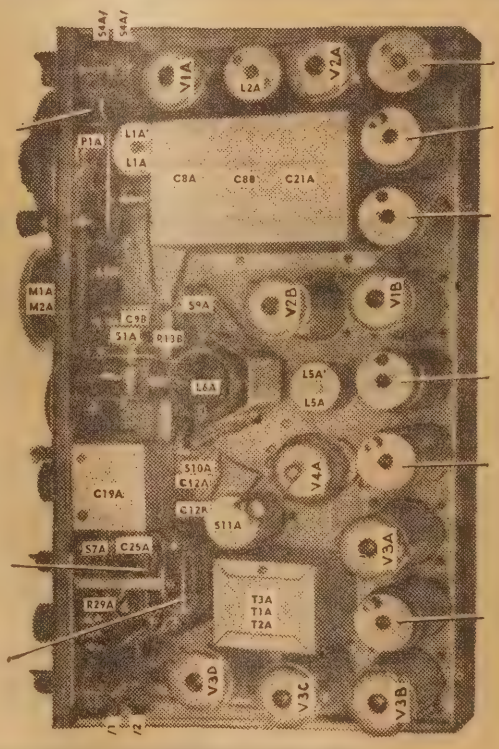
The Following Accessories Supplied—

2 GENEMOTORS
1 THERMO-AMP. METER
1 MICROPHONE
1 PAIR HEADPHONES.

VALVES USED — 2-1C7G, 2-1M5G, 4-1K7G, 1-807. FREQUENCY RANGE 4.2 to 7.5 MC.

If forwarded by rail, all care but no responsibility taken for damage incurred.

£9/10/- F.O.R.



PARAGON RADIO

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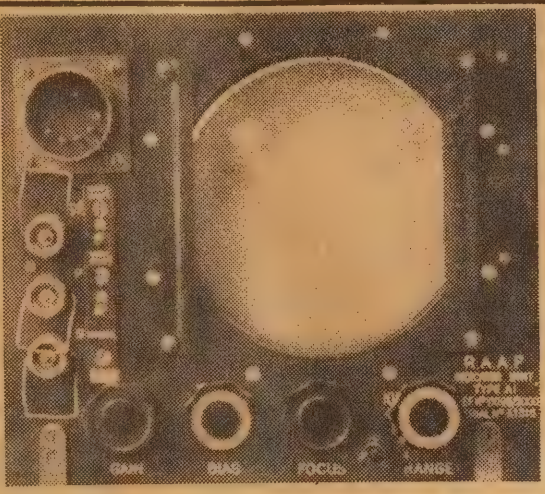
Surplus RAAF Equipment



FRONT VIEW

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F.O.R.

With slight alterations these units can be used as a modulation checker for ham transmitters.

Now is the time to build that panoramic adaptor you have been thinking about.

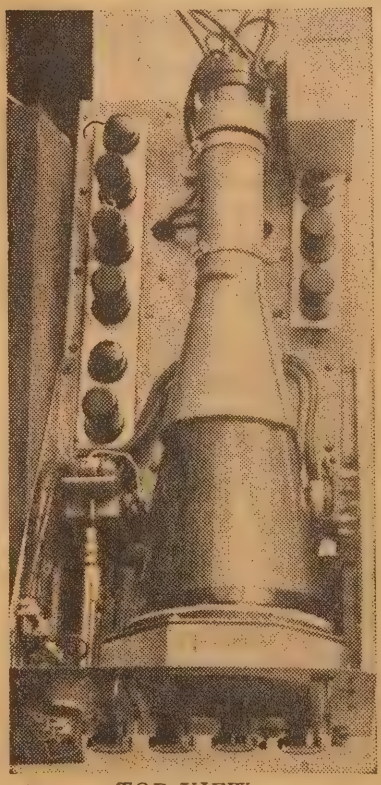
Limited quantities are available. Place your order now. These may not come again.

'While they last,

£10/17/6
F.O.R.

Build yourself a 5 inch oscilloscope with one of these units.

New, and complete with all tubes, including the 5BP1 Cathode Ray Tube. Other valves are, 6—6AC7 R.F. Penthodes, 3—6H6 Twin Diodes. Parts include many Potentiometers, Resistors, Condensers, etc.



TOP VIEW

PARAGON RADIO

245 PARRAMATTA ROAD, HABERFIELD, N.S.W.

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FROM THE SERVICEMAN WHO TELLS

Variety is the spice of life, it is said, and the spice this month was provided by a man who had acquired a whole stack of recordings and decided to make good use of them. His first attempts to provide his own music were not an unqualified success and that was where I came in on the job.

OUR friend was fortunate in having quite a modern receiver on hand, already fitted with pickup terminals, so that there was no particular problem about attaching the pickup to it. The pickup was an ordinary prewar magnetic type which, I think, came from the same source as the records.

In the absence of an electric motor, our friend had obtained a spring turntable and, being something of a cabinetmaker, had fitted the lot into a polished box. The combination looked much better than it sounded.

Closer inspection of the pickup revealed that the needle and chuck were almost completely rigid in the head, showing that the rubber packing had lost all resilience. Another point was that the pickup was mounted too far back from the turntable, which was causing a serious tracking error.

PERISHED RUBBER

One does not tamper with the adjustment of pickups unnecessarily, but this one was in such a state that it could not but be improved. Removing the cover showed the rubber to be perished, and, without further ado, the pickup was carefully dismantled and the old rubber scraped away from the needle chuck and armature assembly.

In the absence of a better substitute, the original tubular rubber sleeve was replaced with two small pieces of bicycle valve rubber tubing, which is generally made of good quality resilient rubber. The little pads for the upper end of the armature were cut with a razor blade from a thickish rubber band which arrived around some office stationery. Servicemen should keep their eyes open for odd little scraps of rubber which may be useful for pickup repairs. Put them in a matchbox where they will be to hand when required.

The pickup was put together again and mounted on the motor board in a position which gave a better tracking characteristic. The performance after this treatment was vastly improved, but one could still not relax and enjoy the music. Remembering that it was a magnetic pickup, I clipped a 50,000 ohm resistor across the pickup terminals in parallel with the leads. This gave a much better tonal balance. Most magnetic pickups operate best into a load of from 50,000 to 100,000 ohms, whereas the load provided by the volume control in this set was about 0.5 megohm.

One factor remained to compromise results, namely, the noise heard direct from the pickup itself—needle chatter, in other words. Just how unpleasant this direct acoustic output can be is best judged by turning an amplifier right off and listening to the chatter from the pickup needle. We advised our friend to fit a lid over the motor and pickup assembly, and, when this was done a few days later, he reported to us a much happier man.

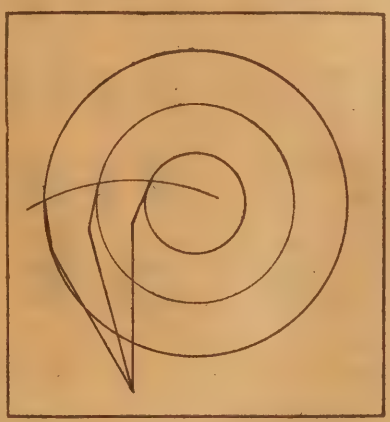


Figure 1. Illustrating the excellent tracking characteristic of a properly situated bent arm pickup. Most modern pickups employ either a bent arm or offset head.

The matter of tracking is quite important, both from the point of view of quality and of record wear. Unless the armature axis is tangential to the groove at the point of contact, the needle bears heavily against one side of the track, causing it to produce a distorted waveform and also to tear the track more than it should.

New pickups sold before the war almost invariably came to hand with a mounting template in the carton showing the correct distance between the base and the turntable spindle. This practice is not always followed nowadays, and the distance has to be "guestimated" by other means.

TRACKING ERROR

In the first place it is impossible to obtain completely accurate tracking with a radial type arm, although, by careful design, the tracking error can be reduced to an unimportant minimum. A short, straight arm is the worst offender, the error being reduced by increasing the length of the arm and also by curving the arm by a critical amount or offsetting the head. Recognising this, the aim is therefore to obtain the best average tracking conditions over the surface of a disc.

If you are not used to judging these matters by eye, a helpful gadget can be made up in a few minutes from a scrap of white cardboard. Cut a strip about 6in. long and 1in. wide and draw a heavy line along the centre, describing a circle near one end. Cut out this circle with sharp scissors to a size where it is a neat fit over the turntable spindle.

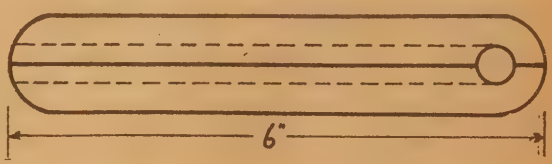


Figure 2. Made from a strip of white card, this little gadget is a big help in adjusting a pickup for correct tracking.

Finally, draw a couple of light lines from the edge of the hole and parallel with the heavy centre line.

Begin by placing the pickup base in the approximate desired position and so far from the turntable spindle that the needle projects over the spindle by about 3-8in.

USING THE GUIDE

Now slip your cardboard guide over the spindle and place the needle on the heavy line at a distance corresponding to the outside groove of a 12in. disc. Sight along the front edge of

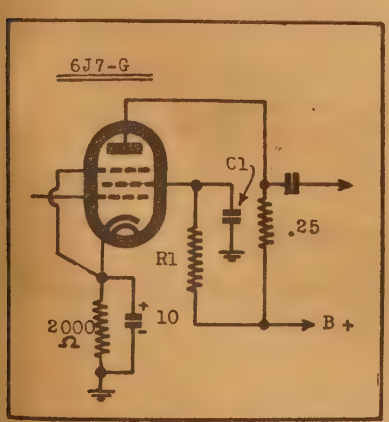


Figure 3. Weak and distorted output was the complaint in this set. Trouble was lack of screen voltage on the 6J7-G, due to an open circuited resistor R1.

the pickup to one of the lines and note whether or not the two are parallel. Now move the needle along the other points nearer the centre of the record, each time noting the degree of error in the tracking angle.

Repeat the whole procedure with the pickup base pushed, say, ¼in. closer to the spindle, noting whether the average tracking characteristic is improved or not. You may find, on the other hand, that the tracking is better with the pickup moved further back than the original position.

One cannot go into the whole question here, but, depending on the design of the pickup arm, you will generally find that zero tracking error can be achieved at one or two points on the record surface, with increasing error away from those points. It is simply a matter for careful observation and choice of the best average position.

QUIZ TECHNIQUE

Occasionally I like to diagnose trouble in traditional MD style. You know the idea—take a quick look over the externals of the chassis, listen to the noise it makes, and say that this part or that part is the cause of the trouble. It's a variation in mental approach to an everyday task.

The set I have in mind tuned in broadcast and short-wave stations quite normally, but gave poor volume and very distorted output. Clearly a deficiency in the audio end, I sagely observed.

The valve lineup proved to be 6A8-G, 6G8-G, 6J7-G, 6V6-G, and 5Y3-G. It could have been a faulty 6J7-G or 6V6-G, or even a worn-out rectifier. But my first guess was none of these. Attention centred on the 6J7-G pentode, which would almost certainly employ the traditional values of cathode resistor and series screen feed. My No. 1 guess was that there was no screen voltage on the 6J7-G.

So out came the chassis, and the multimeter was set to the 500-volt scale and connected between the 6J7-G screen pin and chassis. Sure enough, the pointer did not budge, showing that my answer had hit the jackpot. Now have a look at the circuit.

The trouble could be explained by a breakdown in the bypass condenser C1. Sometimes constructors use a 200-volt condenser in this position, on the grounds that the operating screen voltage is not higher than this figure. Actually, when the set is first switched on, there is no voltage drop across R1, and the full high tension voltage is applied across C1. But it was a good 400-volt type in this set, and I did not think it to be the cause of the trouble.

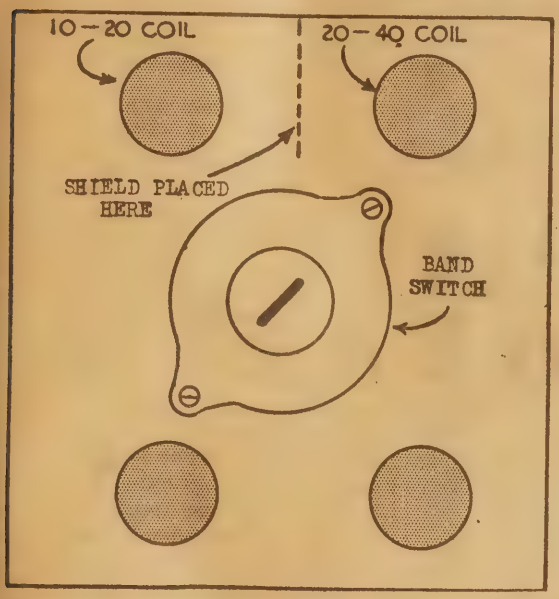


Figure 4. A locking effect was evident in a short-wave receiver due to coupling between the used and unused coils. A shield between them cured the trouble.

Accordingly I connected the meter in parallel with the 1.5 megohm resistor R1, and there was an immediate surge in the volume. Obviously the resistor was open circuited, and connecting the meter in parallel with it fed high tension voltage to the screen. It was a simple matter to instal a new 1.5 megohm resistor.

Strangely enough I have come across this fault quite a few times lately, which, of course, made it easy for me to pick the trouble. The cheaper type of resistors appears to be the worst offenders, their resistance becoming apparently infinite after a few months' operation with the screen current flowing through them. When effecting a replacement, be sure to use a good quality 1-watt type.

The change in resistance can be fairly gradual in some cases, and it is likely that many a receiver and amplifier is operating right now at impaired efficiency because of a failing screen resistor. Check the resistor at the next opportunity and, in case of doubt, replace it with a new one.

By the way, you cannot hope to measure the actual screen voltage with a multimeter. The resistance of a typical meter, even on the 500-volt scale, is 0.5 megohm, which is only one-third the value of the circuit resistance. The meter will simply show a small forward movement, indicating the presence of a positive voltage.

OSCILLATOR PULLING

An interesting point came to light the other day when I had to deal with a home-constructed short-wave receiver. The se performed in really excellent fashion right over the short-wave bands, but seemed unaccountably po[illegible] on the 20-metre amateur band.

Tuning up to the band, one heard a few odd signals and nothing more. There was simply no sign of the dozens of other stations to be heard on another set.

At first the trouble was thought to be instability or squegging in the frequency changer valve, and this was supported by a tendency to "plop" and motorboat at the particular frequence. Accordingly, as a tentative measure, a 100 ohm non-inductive resistor was connected in series with the oscillator anode lead. It reduced the grid current somewhat, but did not have any drastic effect on the operation of the set.

Finally I connected up the modulated oscillator to check over the alignment and band coverage, and here a most interesting effect was noted. Approaching the band from the low frequency end, the receiver behaved quite normally to about 14050 kc., then jumped suddenly to just under 14400 kc. Turning the dial in the opposite direction produced precisely the same effect. The receiver just would not tune to any of the intervening frequencies. Clearly some locking effect was evident.

ABSORPTION EFFECT

Examination of the layout revealed the lower frequency coil spaced nearly twice the diameter from the coil in use, but mounted in the same plane. Shorting out this unused coil with a screwdriver immediately allowed the receiver to tune normally over the band. Clearly the absorption effect was connected with this coil.

The bandswitch did not allow the unused coils to be shorted out, so a small shield was cut and bolted between the two offending coils. A touch on the trimmers, and the receiver never looked back.

It was pure coincidence that the absorption effect occurred right in the centre of a much-wanted band, but the lesson is obvious. It is wise to avoid mounting coils in the same plane and too close together. They should be separated by at least twice the diameter, and either mounted at right angles, or so grouped around the switch that maximum separation occurs between coils used for adjacent bands. Alternatively, shielding can be placed between them.

FADING TROUBLE

A set came in the other day with a note to the effect that it had been fading badly during the last few days. Examination of the chassis revealed a slight blue glow down inside the rectifier plates. It was clearly "on the way out," but the high tension voltage was not much below normal.

As a matter of interest, the receiver was allowed to operate for a half-hour with the faulty rectifier still in position, and a further check was made on the high tension voltage. This time it was down to just over 100 volts, and the whole performance of the set was poor.

The set was switched off for a while and then on again. The high tension voltage started out at just under 250,

but gradually dropped off to the 100-volt mark once more. A new rectifier was installed and the set returned with full assurance that it would not fade again.

AND TWO FOR THE ROAD

And here are a couple of points which hardly qualify as service hints but which nevertheless seem to bother the semi-technical souls. "Why is it," they ask, "that one of two push-pull valves can be withdrawn from an amplifier without greatly affecting the volume?"

Some assert that they can hear no difference at all. So why use two valves?

There is no mistaking the difference between one and two valves in a class B or AB2 amplifier, but I agree that it is less apparent in the usual class A or AB1 amplifier.

People usually make the "test" with the amplifier operating on any old programme and at room volume, which is still well within the power capabilities of the remaining valve. Furthermore, removal of one valve generally means that an excessive voltage is applied temporarily to the other one, so that it operates under higher voltage and current conditions.

Add to this the fact that our ears are not very sensitive to moderate changes in volume level, and you have the explanation why a startling difference is not immediately apparent.

But the keener ear will notice a difference. If the system is capable of reproducing real bass, you will note that the reproduction now sounds somewhat thin. In fact, the unbalance in the output transformer brought about by the removal of one valve has reduced its inductance and lowered the bass response.

Now leave the one valve in its socket and turn up the volume until distortion just begins to be apparent. Now plug the other valve in and wait for it to heat up. Notice the extra fullness in the quality. See what I mean?

PEANUT VALVES

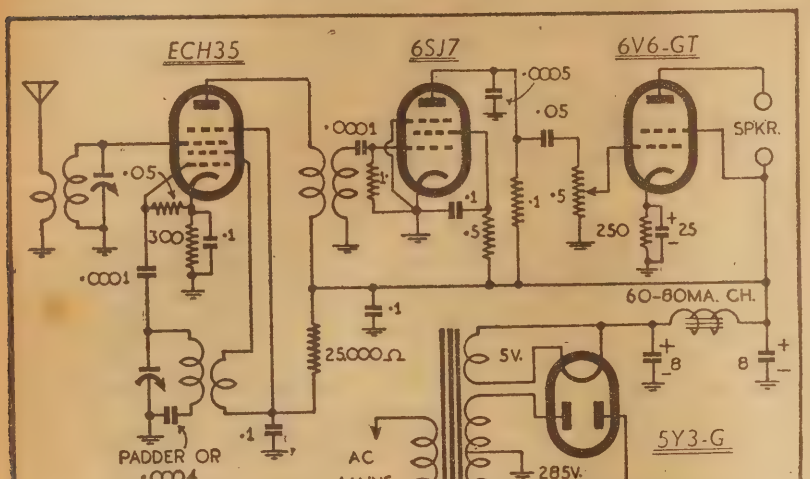
The other point concerns these new 1.4-volt midget valves. In fact, any of the valves using the button type socket.

The little metal insert in the centre of the socket is not just there for ornament or mechanical strength. It is intended to act as a shield between the various pins at the base of the valve, notably the grid pin and plate pin. If you are trying to build a set using these sockets, make sure that you earth the centre metal sleeves to the chassis. If you don't, you will find the set hopelessly unstable, irrespective of any extra bypassing and shielding which may be installed.

A READER BUILT IT!

Gadgets and circuits which we have not actually tried out, but published for the general interest of beginners and experimenters.

TWO CIRCUITS FOR A-C MANTEL SETS



Those who like experimenting with small superhets will be interested in these two circuits, submitted recently by R&H readers. One uses three valves, the other four. In both cases, excellent results are claimed.

THE four-valve circuit was submitted by Mr. E. Williams, of 4 Hastings-road, Botany, NSW. Says Mr. Williams:

"Using iron cored coils and high gain tubes, I found it the best small set I have ever built. The selectivity and volume are all that can be desired and, under normal conditions, interstate stations should come in at fair volume."

The ECH35 was used for preference in the set, but it could be replaced by the 6A8-G, 6J8-G or EK2-G. Similarly a 6J7-G could substitute for the 6SJ7 and a 6F6-G or EL3-NG could replace the present output valve with an appropriate change in the cathode bias resistor.

Mr. Williams is keen on the idea of building up this set using midget coils, IF transformers, gang condenser and a 3-inch loudspeaker.

The circuit differs fundamentally from the well-known "Little General" in that the IF amplifier stage has been omitted in favor of a high gain detector, which provides substantial audio gain. No AVC is provided by this arrangement, but the high audio gain would ensure very loud signals on all the stronger stations.

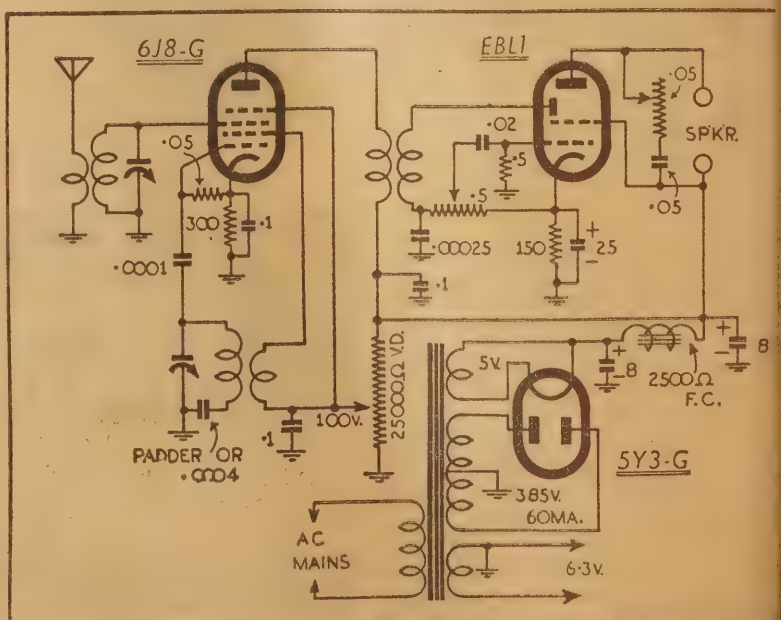
Designer of the three-valve set is Mr. D. J. Broad, of 72 Stantenborough street, Erindale, SA.

This set has a conventional 6J8- converter stage, which feeds its signa through one IF transformer straig into the diode of an EBL1 diode-outp pentode. The signal is rectified in th normal way and fed via the volun control into the grid of the pento output section.

At first glance the overall ga would appear to be rather low, b Mr. Broad assures us that, with reasonable aerial, it has all the ga and power necessary to receive loc stations.

"It has been mistaken," he says, "f a five-valve circuit. With a 12-in loudspeaker it has too much volur at full output for any medium si room. It works excellently with a Co mocord crystal pickup."

The original circuit provides for 385 volt power transformer and a 25 ohm field coil in the filter system. used with a permagnetic loudspeak the field coil could be replaced by filter choke and the power trar former secondary rating reduced to 2 volts, as in the four-valve circuit abo



TRADE REVIEWS AND RELEASES

F.N. MIDGET CONDENSER

IDEAL FOR BABY SETS

Quite a news item of the month is the release of a brand new miniature two-gang condenser. This type of component is bound to become a stock item before very long, and this job appears to be first in the field. It has many interesting features.

A FEW months ago FN Radio announced their intention of producing a baby two gang condenser for broadcast receivers, which was to be the smallest and most compact yet made available on the Australian market.

After the usual trials and tribulations which beset manufacturers of new components these days. Mr. Ferguson laid one on our bench the other day with the announcement: "This is it!"

As promised, the condenser certainly is a baby, and has all the earmarks of success.

DIELECTRIC

One reason for its size is the use of special insulating plates instead of the normal air de-electric. They are made of a plastic material, and separate the rotor plates which are of light gauge brass sheet. This is a principle which has, of course, been used quite successfully in the past, but to our knowledge, is seen here for the first time coming from an Australian factory.

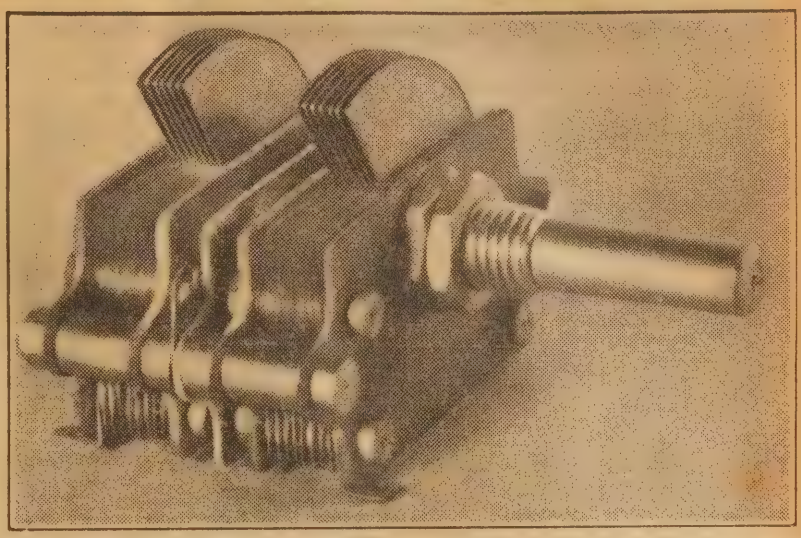
The capacity of the condenser sections ranges from 8 mmfds. to 360 mmfds., which means full broadcast band coverage with standard characteristic coils. It measures 1 7/8" x 1 7/8" x 1".

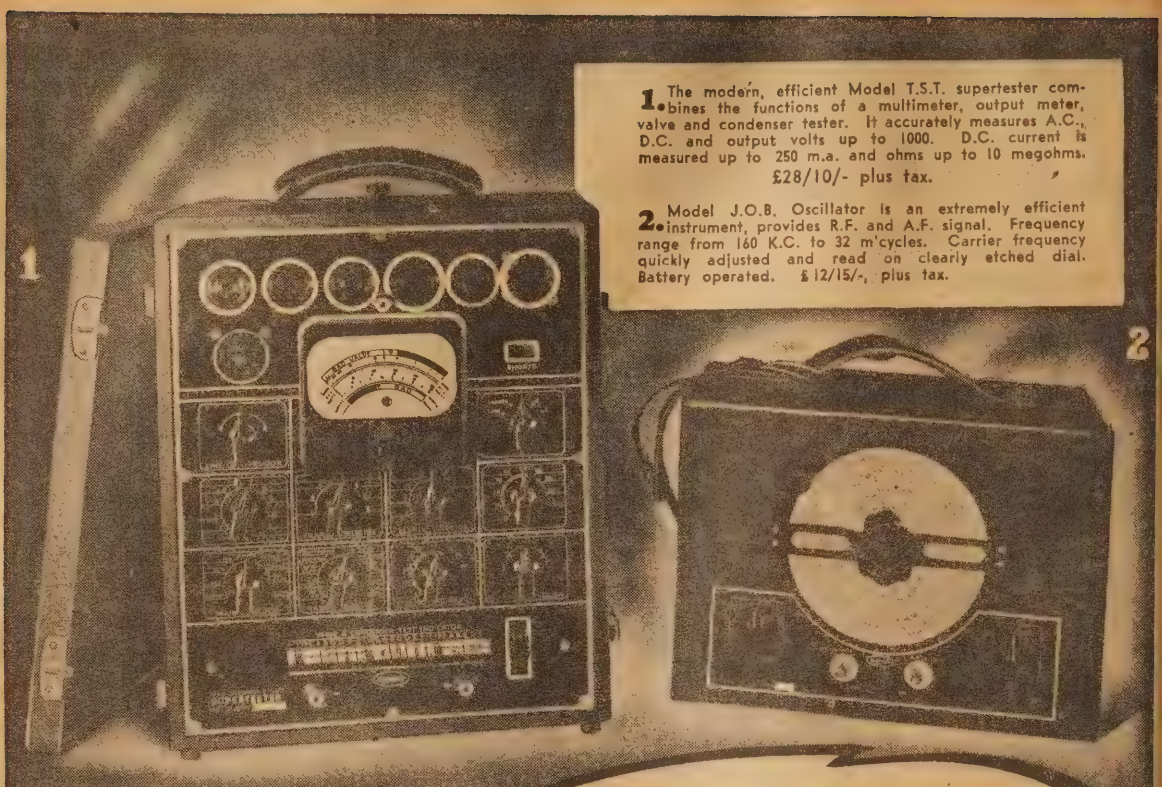
Mechanically it is quite a sturdy job. Being bolted together between bakelite end plates, with a shield plate between the two gang sections. It is intended for single hole mounting.

MANY USES

For portable, and particularly "personal" sets, this gang looks to be just the thing. There are no trimmers to it, but in any case, it is generally more convenient to mount these separately.

The gang sells for app. £1 retail. Mr. Ferguson promises to let us have a sample of the condenser in the single-gang type, which should have many uses, particularly in receivers using reaction and a single tuned circuit. It certainly packs plenty of capacity in a small space.





1. The modern, efficient Model T.S.T. supertester combines the functions of a multimeter, output meter, valve and condenser tester. It accurately measures A.C., D.C. and output volts up to 1000. D.C. current is measured up to 250 m.a. and ohms up to 10 megohms.
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these basic instruments, the accuracy, dependability and advanc
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Never before has "University" leadership been so impressively demo
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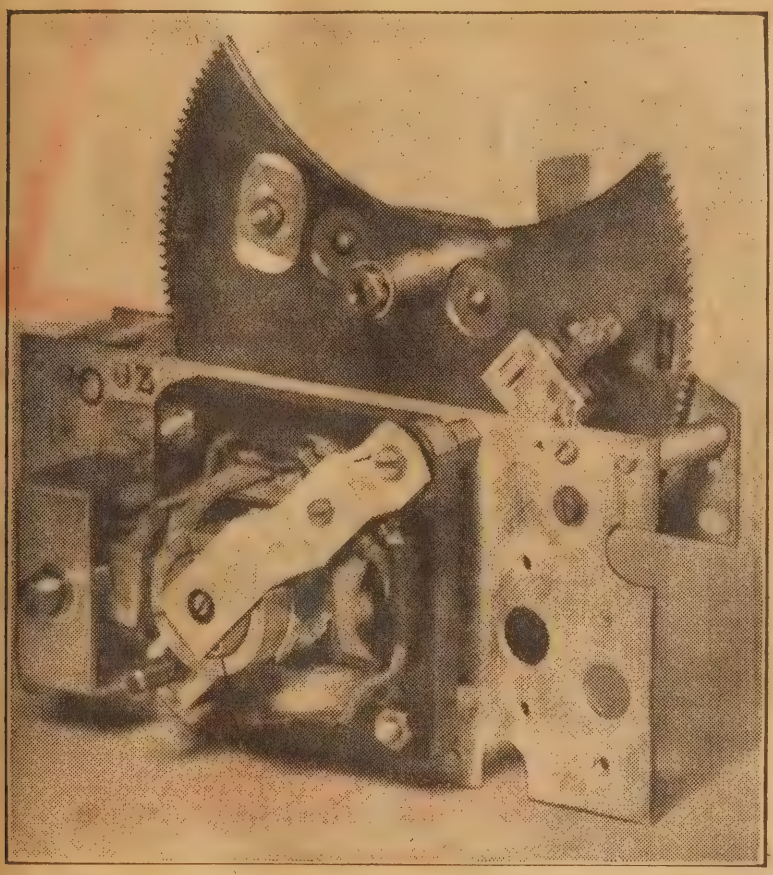
A GOOD BUY FROM PHILIPS



Above is a photograph of the motor assembly being offered by Philips—just the thing for model and radio enthusiasts.

We have received a sample from Philips of a most elaborate motor-driven tuning unit originally intended for broadcast receivers, and now made available direct from this firm as surplus stock.

IT is pretty well the most ambitious design of this type we have seen here, comprising a reversible electric motor for use on 240 volts AC, a selector unit actuated by press buttons, and, of course, the press-button assembly itself.

Althqugh there appears to be no reason why it should not be used for its original purpose, Philips consider that the motor itself will find many other uses in the hands of the enthusiastic home builder or amateur.

The reversing is accomplished by the alternative use of two field coils set at 90 degrees around the motor axis, the other 90 degrees of phase reversal being obtained by switching through a .5 mfds. 400 volt working condenser, fairly easily obtainable at the moment. The other two field windings are, of course, wired in parallel, and in circuit all the time.

The motor is fitted with a speed governor and a clutch which automatically engages when the power is applied. A set of gears then step down the speed for the purpose of driving the dial. This entire unit is beautifully made, and includes an automatic cut-out switch operated from the selector unit itself.

When one considers the price asked for miniature motors of this type as are frequently used for driving models, &c., the price of 37/6 for the lot seems very reasonable. In fact, we doubt whether a similar motor could be bought anywhere at any price.

COSSOR RADAR IN "QUEEN ELIZABETH"

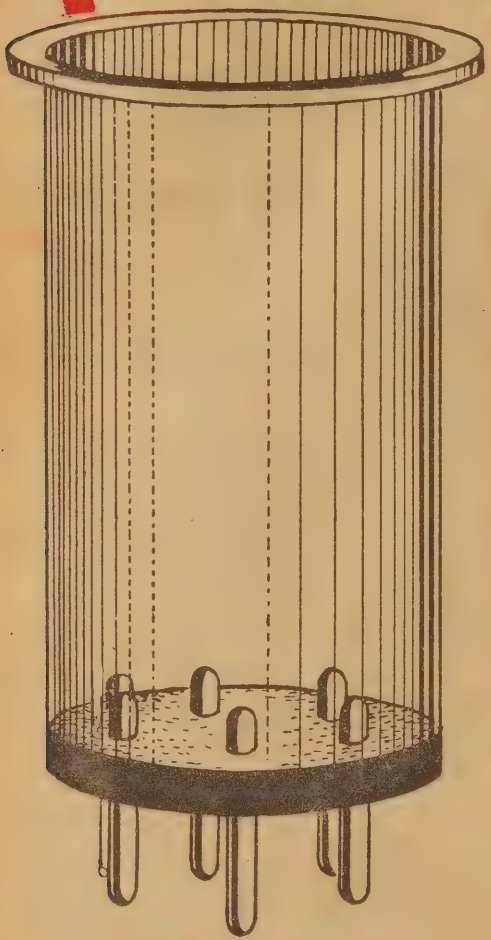
WE have received the following advice from Mr. Jacoby, director of Jacoby and Barrow, 477-481 Kent-street, Sydney:—

"In a recent issue of 'Radio and Hobbies,' we were pleased to note the article entitled 'Radar to Safeguard World's Ocean Journeys.'

"The radar featured in this article, as mentioned by you, is made by our principals, Messrs. A. C. Cossor Ltd., and we are happy to tell you that we have received advice from our principals that this equipment will be available to shipowners in Australia in the near future.

"In their last letter to us, Messrs. A. C. Cossor Ltd. state that their radar equipment worked admirably during difficult conditions on the last voyage of the 'Queen Elizabeth'."

6 PIN PLUG-IN COIL-FORMERS



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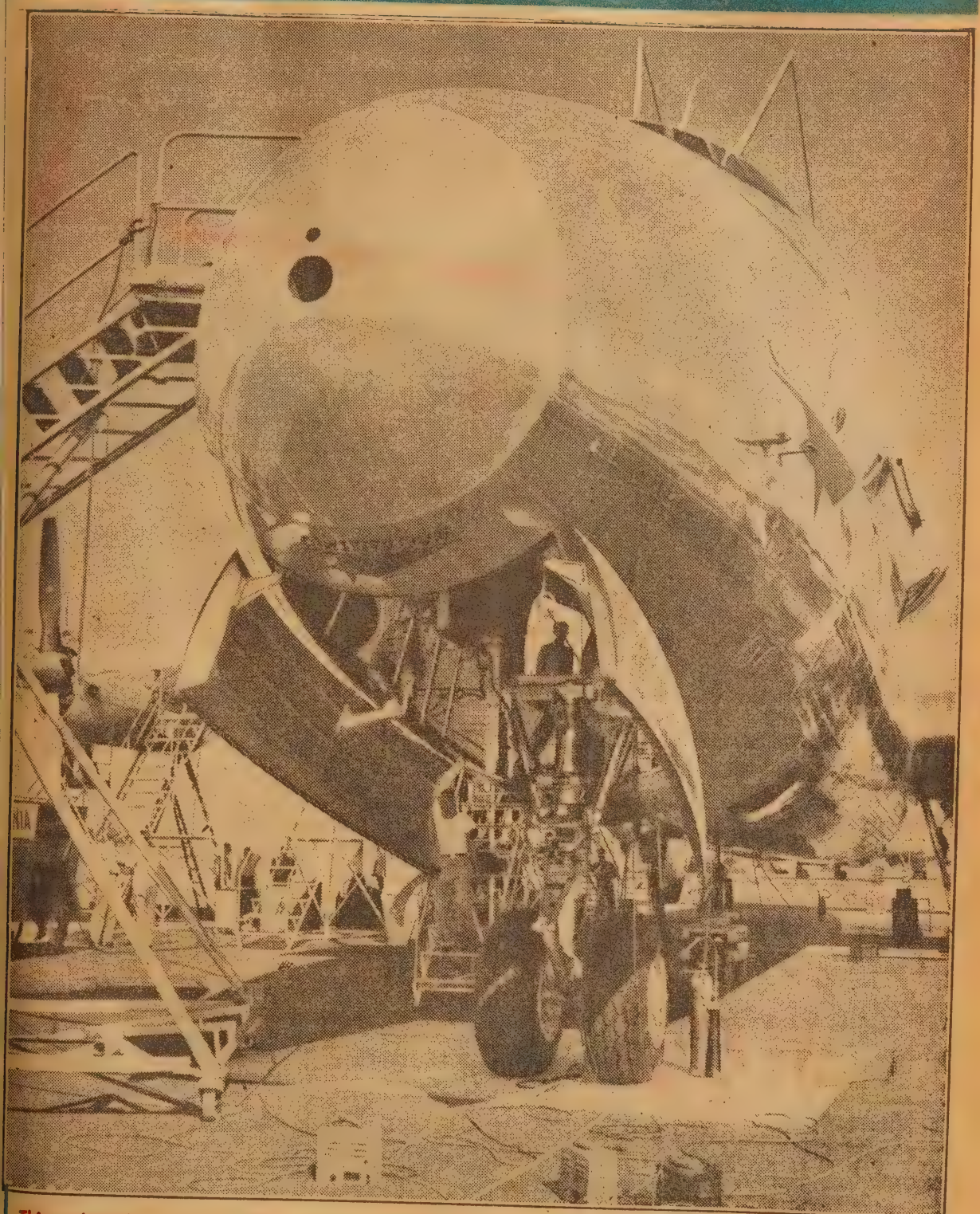
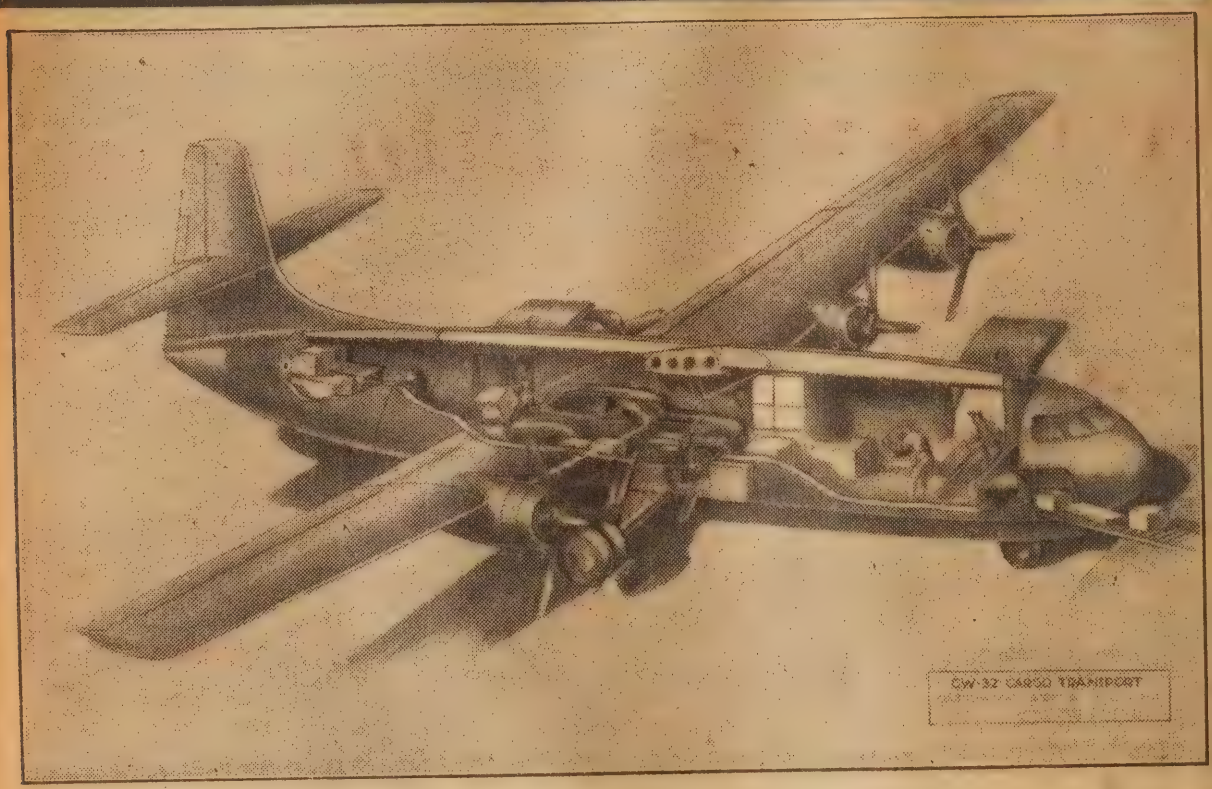


This splendid picture of USA's largest aircraft, the Constitution, gives an idea of its great size. The nose landing gear is clearly visible, showing the 44-inch diameter wheels. When in service, there will be a passenger entrance as well through the nose. There are four engines of 12,000 total horsepower. The plane weighs 92 tons.

A NEW AIRCRAFT FOR CARGO WORK



An exploded view of the CW-32 showing how cargo may be carried and loaded.

A four engine cargo aircraft designated the CW-32 is under development at the Airplane Division of the Curtiss-Wright Aircraft Corporation in its plant at Columbus, Ohio.

CAPABLE of carrying 25,000 pounds 1500 miles or 20,000 pounds 2500 miles without refuelling, it is the first aircraft of its size and range designed specifically for cargo-carrying.

It weighs 80,000 pounds when fully loaded and has a maximum cruising speed of 270 miles per hour at 25,000 feet.

The outstanding characteristics of the CW-32 are the low operating costs, great flexibility as to type of load carried and low loading costs.

The aircraft will operate in America at a direct cost of less than five cents per ton mile, making it directly competitive on a ton mile basis with fast ground transportation while offering a much faster service.

The prototype aircraft is scheduled to be completed early in 1948.

For ease of loading, the CW-32 will have a low floor equal to truck bed height—45 inches from the ground—made possible by the high wing type of design, and several doors for access into the cargo space.

It has a total cargo volume of 4000 cubic feet in one compartment, 59 feet long, 9 feet wide, and from 7 to 9 feet high.

In addition to a separate crew entrance, there is one nose door of moderate size for direct loading from a shipping dock and three large doors on the sides for loading from trucks.

An optional tail opening arrangement, whereby the entire aft-end of the fuselage may be raised, will permit full cross-section end loading of big articles, such as automobiles, trucks, industrial machinery or other items too bulky to be loaded through the side entrances.

The pilot's cabin is to be pressurised and special attention given to crew comfort and convenience for long flights.

Power for the CW-32 is to be supplied by four R-1820 Wright Cyclone engines with exhaust driven turbo-superchargers.

The aircraft is to be equipped with Curtiss electric reversible propellers to provide the maximum in landing run safety and manoeuvrability for ground handling.

The use of these propellers make it possible to taxi up to shipping dock for loading and backing away without auxiliary equipment for moving the aircraft.

Automatic propeller synchroniser will be standard equipment.

This new aircraft will fill a recognised need for transporting cargo by air to all parts of the world with speed, efficiency and economy.

by

Boris Carone

KP3

LET'S GET TO THE CORE OF THINGS

As with all KINGSLEY radio products the reason why "PERMACLAD" I.F.'s are now spoken of as the best in Australia is found in the ferromagnetic iron-dust cores used in their construction. Apart from the inherent technical superiority of iron-core tuning, every "PERMACLAD" I.F. is turned out on a production line that sets a particularly high standard of quality.

So from the first to the final step . . . that of oscillagraph testing and tuning . . . each I.F. is made to give the absolute maximum in performance. The use of the enclosed pot-type ferromagnetic cores give KINGSLEY PERMACLAD I.F.'s a particularly high degree of permeability, high "Q" and gain.

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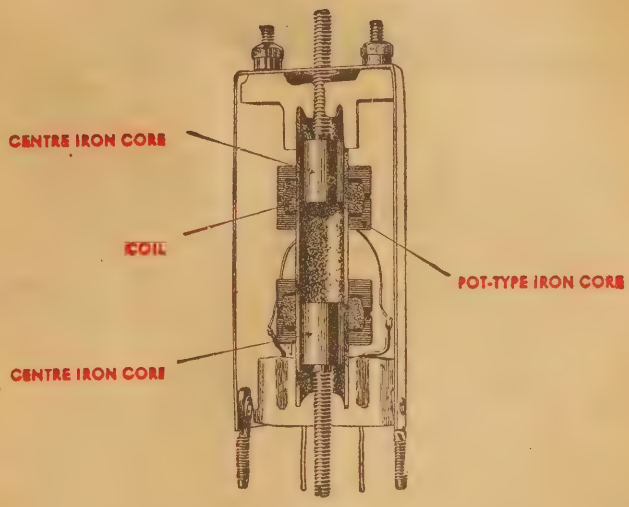
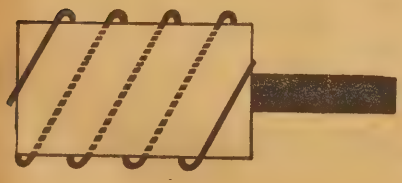


The above diagram is a cut away sketch of a PERMACLAD I.F. Tuning is done by the two centre iron-cores.



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ENGLAND'S MAMMOTH—THE BRABAZON

Britain's New Luxury Air Mammoth ---

A mammoth aerial express designed for long-range passenger transport the 100-ton Brabazon I. is now under construction by the Bristol Aeroplane Company of England. Designed to cover the England-Australia route in 48 hours, the Brabazon is to provide day and night transport of 72 passengers in luxurious comfort.

A CONVERTED model for short-distance routes will be able to carry 224 passengers.

This leviathan of the skies dwarfs all the wartime bomber giants.

The machine will have a non-stop range of 5000 miles at a cruising speed of 250 miles an hour. Its pressurised fuselage will provide normal conditions at any altitude at which the airliner may fly.

Luxurious saloons are heated and air-conditioned, a double deck amidships, with large saloon and snack bar and a dining saloon to seat 24.

RADIO GEAR

The pilot's cockpit is in the nose, with seating for two side by side. Immediately behind it is the control-room, with radio operator and navigator. The latest navigational instruments are carried, including radar.

There are gangways by which the engineers can enter the wings to attend to the two motors mounted in each wing. Fuel-tanks are built into the wings.

The sketch here shows the prototype Brabazon, which is at present being built. It will have four ordinary piston motors, each driving two contra-rotating propellers, for its trials to be held this year, but it is unlikely to go into service in this form. The motors will be replaced by eight gas turbine jet units, according to latest decisions.

The Brabazon is a low-wing monoplane with a span of 230ft. Its fuselage, which is 177ft. long, is circular in section throughout, but it tapers towards nose and tail.

The tail unit consists of a cantilever tail plane and a fin and rudder wh stand 52ft. high when the mach is on the ground.

Tricycle-type undercarriage of do wheels is fitted.

Freight and luggage are to be commodated in the base of the fusel both forward of the wings and in rear section.

The central section includes saloon and cocktail bar and the di saloon, with the galley below.

ATOMIC WELDING PRESERVES STE

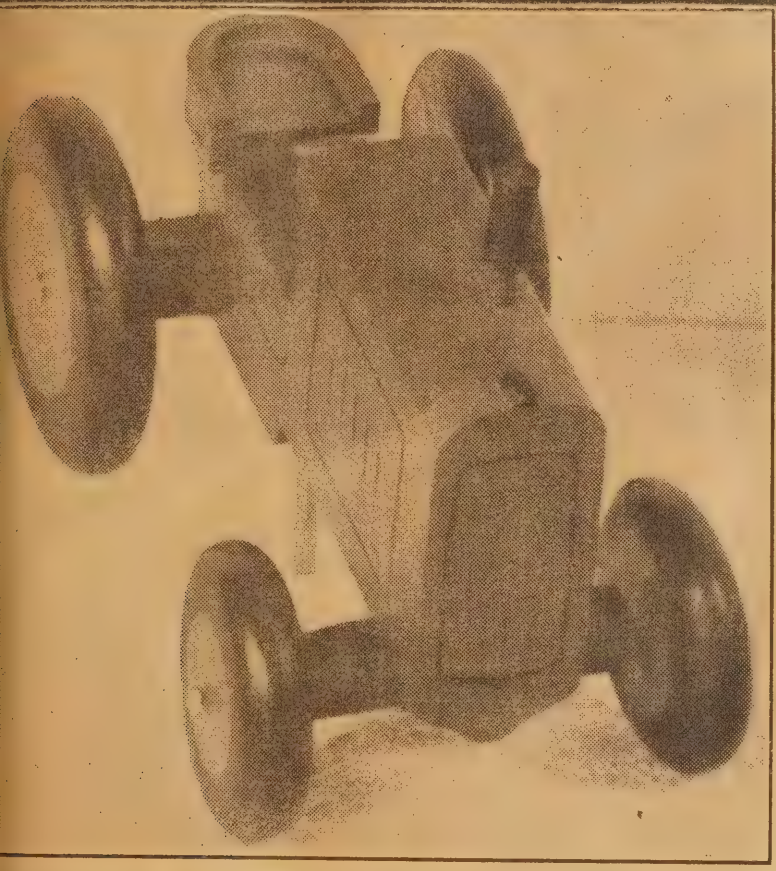
DEVELOPMENT of the jet engine which powers the Lockheed P-80 Shooting Star might not have been accomplished had it not been for new and highly perfected methods of welding. The I-40 jet engine contains more than 500 joints, all of them welded so securely that they are able to withstand the extremes of heat and strain.

In designing this engine, it was necessary to find a construction material that was both light in weight and heat-resistant. Heat-resistant alloys in sheet form, some only 1-50 of an inch thick, embody both these qualities, and are used extensively in the engine.

Heat-resistant alloys in general classed as stainless steels, and likely to lose some of their corro resistance if the rate of welding is slow. For this reason, atomic-hydrogen welding and resistance-wel processes are used.

Atomic-hydrogen arc-welding method which employs an alterna current arc between two tungsten trodes in an atmosphere of hydr gas, while engineers describe resist welding as a high-speed metho joining metals by using pressure electric heating under accurate trol, and without the addition of welding material.

MAKING A STURDY TOY TRACTOR



Simple to make, yet sturdily constructed, this tractor will form a useful addition to the five-year-old child's playthings. Broadly it is made of scraps of plywood and ½" thick wood, with the wheels made of ½" pine and the accessories of metal.

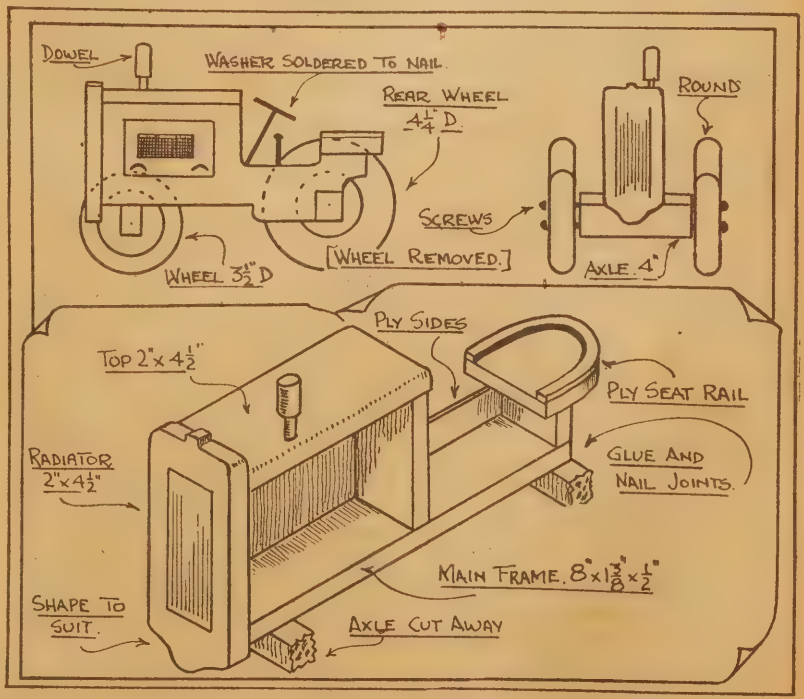
START on the job by getting the ply sides. For this you will need pieces about 9in. x 4in. Tack them ether with a couple of panel pins after planing one edge straight, rk out a shape similar to that wn in the side view of the top ch. Saw to the line with a fret-, being careful to neatly round the de corners. Next cut and dress to three pieces 1⅛in. x ¾in. timber, piece 8in. long for the main frame, ther 3in. long, and the third a rt piece about 1in. long to fit under seat. The radiator needs a piece . long and 2in. wide. Set it out a pleasing shape and after sawing clean the edges and corners with le and sandpaper. A second piece . long and 2in. wide is required the engine top, but notice that ends are square and that the two edges are rounded. A partial mbly can now be made by glue- and nailing all of these pieces to- ner in the appropriate places.

ext make the seat. A small horse-shoe shaped piece of ply is needed for the seat rail. To make this, get a small piece of ply about 2in. square and on it mark a semi-circle, using a radius ¾in. Cut along this line and keep the outside piece. Glue and nail this part to a piece of 2in. square by about ¾in. thick wood and mark the outside shape of the seat. Cut around the outside with a fret saw and clean up the rough places where necessary. The seat is then glued and nailed in place. The exhaust coming out of the engine top is made from two short pieces of dowel. The larger piece is drilled to take the thin piece and a ¾in. hole drilled in the tractor top holds both securely in place.

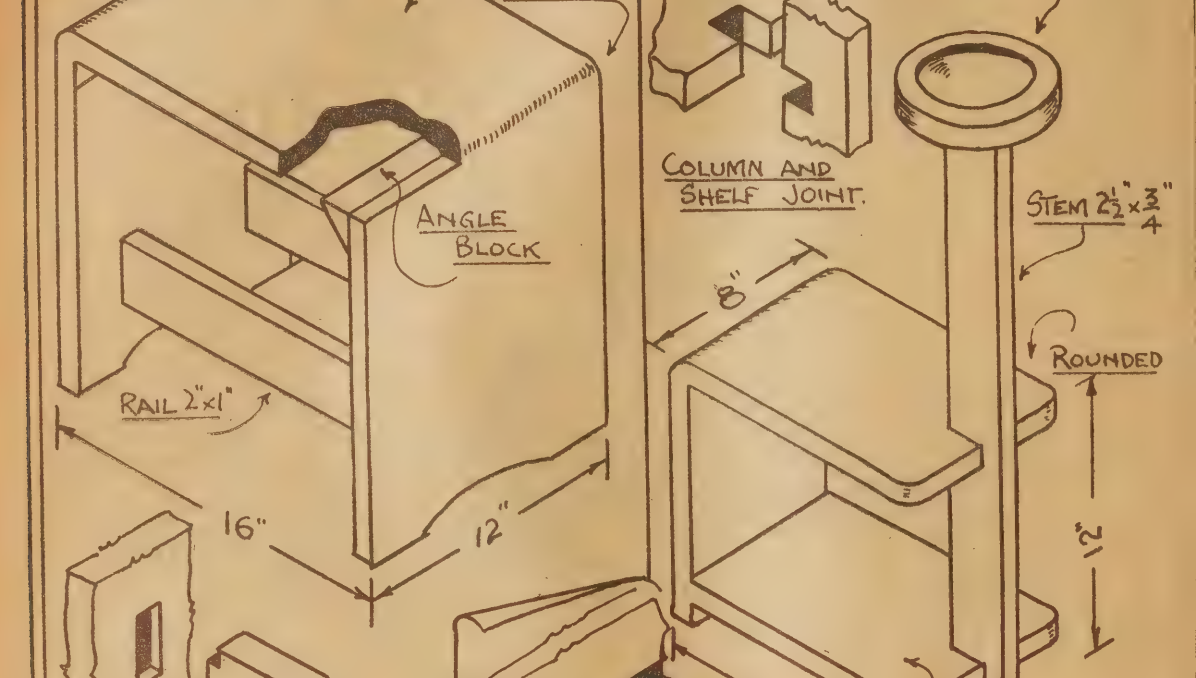
Four wheels of ¾in. thick material are now needed. Make the front wheels 3½in. in diameter and the rear wheels 4½in. in diameter. Round the edges of the wheels to make them look like balloon tyres. Before the wheels can be screwed in place, two axles must be made. Do this carefully, making them about 4in. long. When sure that the pieces are of the correct size, glue and nail them in place and screw on the wheels.

If desired, a steering wheel can be made and this helps to improve the appearance. Solder a ¾in. washer to a thick piece of wire, then drill a hole in the correct place in the frame of the tractor and push the wire into position. A further detail, the gear lever, is made from a large nail fixed in place.

The tractor is finished off in green enamel with the details of the radiator and engine cover picked out in fine black lines.



A SIMPLE STOOL AND BOOKSTAND



A glance at the sketch will show that two useful articles for the home are illustrated this month. Both are made of wood, are modern in design, and when polished form a permanent piece of furniture.

TO make the stool approximately four feet of 12 x ¾in., or 12 x 1in. timber is required. "Solid core" or plywood of similar thickness would prove useful if it is available. Try to select pieces with a figured grain which will show up well when polished. Commence by dressing all faces and edges of the timber, then set it out in three 16-inch lengths. Two of these are for the legs whilst the other piece will form the seat. Notice that on the bottom of each leg it is necessary for a small piece to be cut away. Thus less bearing surface is provided and so will help to offset any irregularities in the floor when the stool is in use. The piece cut away may be any shape, that suggested in the sketch being quite in keeping with the general design.

Two rails are also required. 2 x 1in. timber is probably the best general size for this, and if the rest of your wood is 1in. thick make the rails 14½in. long. This will allow each end to be housed into the leg about ¼in., a suitable type of joint used in the construction here is shown in the detail. As the seat will also be nailed to the legs it is best to drill some holes through the seat top near the ends to prevent splitting. Three holes will be sufficient at each end and they should be positioned to form a dovetail.

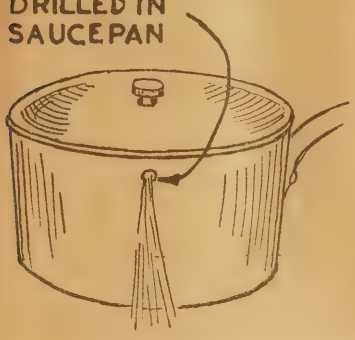
As well two angle blocks are required to give added strength to the top joint. These are easily made by ripping a piece of 2in. square stock down the diagonal after first planing the four faces and making sure that they are exactly at right angles to each other. Cut the angle blocks to a length of about 11in., putting the end cut at an angle if desired. Six holes must now be drilled in each block to take some short, thick crews. Three of th screws go into the leg and three the top.

Clean up all faces and make that all ends are perfectly squar both directions and thus make job ready for assembling. Drive from the outside into the trenche each leg until the point can just seen, then apply glue to the end the rails and nail them in place. three nails in each end of the and glue and nail it in place to legs. Glue the corner blocks and them temporarily in place and test job for "square" making sure that set up on a flat surface. If satisfac proceed with the screwing, then aside for the glue to dry.

Later both ends of the seat rounded (as shown in the ske using a plane and file, then finis off with sandpaper. Stop up all with plastic wood and after car cut the other preliminaries req polish or paint as desired.

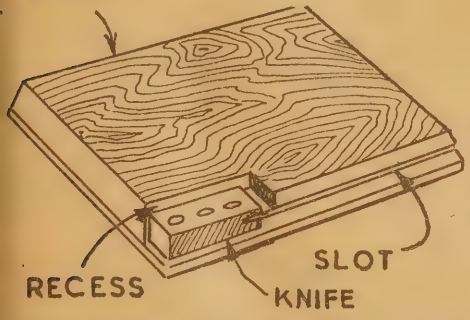
(Continued foot of next page

HINTS FOR THE WORKSHOP



SAUCEPAN DRAINER

A small hole drilled through the side of the saucepan near the lid permits the liquid to be poured off the vegetables. As the lid remains on all the time the vegetables cannot fall out.



KNIFE HOLDER

A slot cut into one edge a bread board and a recess chiselled into the corner will provide a safe place for the bread knife and it will always be on hand.

A SIMPLE STOOL AND BOOKSTAND

(Continued from Previous Page)

The second project has a twofold e as a book stand and also as an h tray holder. Some very useful es are suggested in the sketch but you have a special set of volumes ich you wish to display alter the nensions to suit your own convenice.

Very little timber is required, three t of 8 x ⅜in. for the book stand, n. of 2½ x ⅜in. for the stem, and a ce of 6 x 6 x ¾in. for the ashtray ng sufficient. Dress the timber on faces, then set out the 8in. stuff o the following lengths: 12in. for top; 11¼in. for the end; and 11⅛in. the shelf, which allows enough for of the joints. The joint of the top d end is a simple butt and nail but shelf is housed into the end. This e is illustrated in the diagram and hough no dimensions are shown y can be worked out readily. Notice t the height of the shelf from the und is best set at about one inch.

The details of the stem joints are o shown and care must be exercised e, particularly at the bottom of stem. It will be clearly seen that st of the corners of the job are tly rounded to a suitable radius. All of these except one must be worked before the job is assembled. On the top of the stem is glued and nailed a piece which has been recessed to take a standard ash tray. Make it to a suitable shape, either square or round, to suit the tray you have purchased.

Glue all joints and nail the job together, and when the job has set round the remaining corner joint of the top and end. Stop up all holes with wood filler and finish off with several coats of French polish.

ECH35 CONVERTER

IN a couple of recent set designs we have specified the ECH35 converter. Heavy demand for this type has drained local stocks, and further supplies from England have been held up by shipping and other delays. The Philips Company advise that the shortage is purely a temporary one, however, as they are now awaiting delivery of large outstanding orders.

THE HAM BANDS WITH BILL MOORE

Delegates from all States were present for the 17th Federal Convention of the W.I.A., held in Melbourne over the Easter holidays.

THESE amateurs spent a total of 19 hours in six sessions, deliberating on the future of amateur radio in general, and the WIA in particular. Those who haven't attended a convention probably don't appreciate the amount of work involved, both in and out of sessions. It behoves all hams to give a thought to those who spent their holidays in an endeavor to further the work of amateur radio.

The following delegates represented divisions: NSW, J. B. Corbin, VK2YC; Vic., W. Gronow, VK3WG; Queensland, H. E. Spenger, VK4ES, South Australia, E. A. Barbier, VK5MD, Western Australia, G. Moss, VK6GM; Tasmania, J. Brown, VK7BJ. Members of the Federal Executive present were the federal president, V. Marshall, VK3UK, Federal secretary, A. Clyne, VK3VX and councillors R. Marriot, VK3SI and E. Treharne, VK3AFQ.

The final minutes are, of course, not yet to hand, but some of the major items discussed include the following:—

The future adoption of a constitution in all States uniform on all major points. Divisional constitutions to be varied as required.

The convention agreed in principle to the appointment of a paid full-time federal secretary and editor of Amateur Radio. This officer would act, part-time as secretary of the Victorian Division. The appointee must be an active amateur.

The Federal Executive was directed to approach the IARU on the subject of the division of the HF bands into phone and CW sections. The IARU will be requested to seek advice from other national societies on the desirability of such subdivisions, and when the information is forthcoming the position is to be referred back to the Federal Council for review.

A request will be made to the PMG's Department to change the name of hams in this country from Wireless Experimenters to Radio Amateurs, in conformity with current overseas practice.

Divisions will be requested to bring to the notice of members, and others, the advisability of discontinuing local ragchews on the 14 and 28mc bands during DX hours.

Delegates were unanimous in their thanks to the Victorian Division on their work in organising the convention and felt that the work done was rewarded by the successful outcome of the convention.

TELE-COMMUNICATIONS CONFERENCE

Atlantic City, USA, will be the scene of the next International Tele-communications conference. The conference is timed to commence on May 15th.

Mr. J. Martyn, of the PMG's Department, will represent Australia. Mr. Martyn is well known to Australian amateurs, especially to the VK3's. He departed from Sydney on 29th March. While not wanting to appear pessimistic, the news released in the February editorial of QST on SW broadcasting is not exactly encouraging. The ARRL had hoped (as had all amateurs) that the US was not very interested in SW broadcasting for propaganda purposes. It appears, however, that a special Governmental department has been formed to control such SW broadcasts.

We owe our present comparatively satisfactory position to the unfailing and unwavering support afforded by the US delegation to amateur affairs at the Madrid and Cairo conferences. It was hoped that we would have this support at Atlantic City. KBW states that this new department even suggests that some of our frequencies would be ideally suited for SW broadcast purposes. The final decision rests with those controlling high policy making in the US.

If you carefully analyse the review of the Moscow talks as published in QST, you will see that our greatest problem will be the suggestion that HF broadcasts spread into our bands. The 10MX band was the only one on which all delegates were in perfect agreement. The suggestion of a new band at 21MC was well received by all delegates except those of Great Britain, who had no instructions on the subject.

We should stand on a better footing than ever before; we have behind us a remarkable war record and we hope that more countries will remember these facts and forget their SW propaganda.

VK5JE AWARDED A M.I.D.

Congratulations to Ted Cawthron, VK5JE ex 2JC and 5JC, whose name was listed in the recent 8th Division Honor awards. Ted was in the fortress signals, and was taken POW in Timor early in 1942. He later migrated (compulsory type) to the ill-famed Burma-Thai Railway.

5JE received the Mention in Dispatches for operating secret radio sets in Timor, Java and Siam prison camps. He related his experiences in a lecture to the South Australian Division of the WIA.

2VN RETURNS FROM US

Morrie Myers, VK2VN, returned from the US in March, after spending all his leisure hours in the Ham shacks. Most of the time was spent on the West Coast, where he learnt quite a lot on the origin of the California kw. Strangely enough the best effort was on the east coast where an effective 50kw was beamed towards Australia. He expressed the foreign hams' viewpoint on DX matters at quite a number of amateur meetings. Greatest problem of the W ham is the use of VFO and the forming of a dog-pile, as they call it. (They have just formed one — ZM6AC). The stacking of stations on, over and around every piece of choice DX is sure a problem. They suggest at least 5kc. clear each side. The G's are having quite a rough time according to Morrie, especially from the food viewpoint. The NSW Division of the WIA incidentally recently decided instead of giving direct to British food appeal, forward food parcels to the RSGB for distribution to English amateurs. With periods spent in over 150 ham shacks, quite a number of new ideas will surely be incorporated at VK2VN.

DX AND PERSONAL PARS

A couple of choice call signs turned up on 20 recently, OCL2A and BA4ZB/ the latter being contacted, stated he was in Seoul Korea. Suppose there is an explanation for the BA prefix.

For those amateurs that contacted ZC6UA and SVIEC during 1946, and still hope for QSL, this will be good news—Eric G2EC reported having printed cards for ZC and the calls and will be forwarding them shortly.

VR5PL should be in the Society group, quite strong on 40 MX—watery note and drifts a lot, about 7080kcs.

VQ8AD was the victim of a VFO attack the other evening, while QSO, W8YZ—the latter turned on the offenders and the remarks were illuminating. Quite a few stations.

(Continued on Page 75)

SHORT WAVE NOTES BY RAY SIMPSON

NEW STATIONS ON ALL BANDS

MANY CHANGED FREQUENCIES

This month we have a particularly large number of new stations, some of them very interesting indeed. Chief among these were the two Jamaican stations mentioned elsewhere which we hope were logged by some of our readers.

THE United States has opened up a new channel in the 16-metre band to give s two new stations in addition to changed equencies for some of their others. Not be outdone, Radio Australia gives us LA10 in the 16-metre band also.

YDNEY F.M. STATION

Visitors to the R.A.S. Show in Sydney will doubt have seen the Frequency Modula-n transmitter which it is intended to put o operation at the close of the Show. The quency to be used will be 92.1 Mc., so we ist that in the near future we will be able construct an F.M. receiver to tune in this tion. The writer already has his antenna dy to erect, and has just received a length 300 ohm cable from the U.S.A. We look ward to yet another interesting phase of ening, and the next few months should ve or disprove some of the things which re been said about F.M.

DIO AUSTRALIA D.X. SESSION

To doubt many of our readers listen to the . session from Radio Australia which is ducted by Ern Suffolk, of South Australia. te a large mail is now received comment-ing on these sessions, which must be encouraging to those responsible. It would appear, however, that overseas listeners are among the chief contributors of material, as we do not remember any of our readers mentioning these programmes in their letters. Whenever possible, drop a line to Mr. Suffolk in Lobethal, S.A., giving him any first-hand information concerning new stations, frequency changes, &c., so that this session can be the means of other listeners sharing in the details.

READERS' LETTERS

We still intend to drop a line to all those readers who are kind enough to forward us their reports each month, but pressure of our normal work has prevented us sending out as many as we would have liked to during the past few weeks. One month's notes are hardly in the press when it is time to start preparing for the next issue, which does not leave very much time to answer correspondence in addition to normal listening and writing for verifications. However, if listeners will bear with the writer for a little longer, he will try to write a short note to each and every one of those who help so much to make these pages interesting.

TEST BROADCAST FROM JAMAICA

JR best scoop for this last month was our reception of VRR5, 12050kc, and ZQI 4700 both located in Kingston, Jamaica, B.W.I. 're first heard VRR5 at 8 am on Monday, rch 31, when they were giving a ball-by- description of the Test Match between aica and Barbados. Reception was very ; but we managed to hear sufficient of play to write for a verification. The l of Jamaica's score was 275 and a few the players' names were clearly heard. r a commentary on the day's play, the ion closed down just after 8.30 am, when call was clearly heard, and also the uency of 12050 kc. The announcer stated the station was owned and operated by e and Wireless, Ltd., and that reports his particular broadcast would be appre-d.

Tuesday morning, April 1, we rose early tuned to the main Jamaica station's fre-cy. ZQI, on 4700 kc. The noise level very high, but around 6.45 am a few s and music could be distinguished. We switched over to 12050 kc and, sure enough, there was VRR5 repeating its call over and over again, and giving their location as Stony Hill, Kingston, Jamaica. A couple of minutes before 7 am they started to play "Land of Hope and Glory," and this being an easily recognised number, we quickly switched back to 4700 kc and, sure enough, the same tune could just be heard.

At 7 am both these stations began another cricket broadcast, and it could easily be followed over VRR5, and some excellent material for verification purposes could be heard, such as various scores and bowlers' names, &c. When we left the station at 7.15 am it was still fairly good, but a Morse station was causing quite a bit of interference.

We doubt if VRR5 will be heard again except in special broadcasts, but suggest that readers have a listen from around 6.30 am on 4700 kc and see if they can hear ZQI, as this will probably be a new country for many listeners. We are now looking forward to receiving our verifications for both these stations.

NEW STATION LOGGINGS

Call	Kc.	Metres.	Location	Time Heard
ZQI	4700	63.83	Kingston, Jamaica	6.30 am
XGSA	6040	49.67	Nanking, China	11.0 pm
XGSC	6095	49.21	Nanking, China	Midnight
FZI	7000	42.86	Brazzaville, F.E.A.	6.30 am
XGTA	9450	31.75	Shanghai, China	10.0 pm
SEAC	9520	31.51	Colombo, Ceylon	2.0 am
BATAVIA	9550	31.41	Batavia, Java	9.0 pm
VUDII	9680	30.99	New Delhi, India	10.30 pm
VRR5	12050	24.90	Stony Hill Jamaica	7.0 am
WCDA	15270	19.65	New York, N.Y., U.S.A.	8.15 am
WRUW	15290	19.62	Boston, Mass., U.S.A.	7.0 am
VLAIO	17840	16.82	Shepparton, Vic.	3.0 pm
FZI	17845	16.81	Brazzaville, F.E.A.	2.45 pm
WGEX	17880	16.78	Schenectady, N.Y., U.S.A.	Midnight
KGEX	17880	16.78	San Franciso, Cal., U.S.A.	5.0 pm
WGEA	21590	13.90	Schenectady, N.Y., U.S.A.	Midnight

FLASHES FROM EVERYWHERE

IRAN

THIS country will be a new one for many listeners, we think; so if this is the case they should endeavor to tune in the new station located at Tabriz, which is the capital of Azerbaijan Province. This transmitter operates on an assigned frequency of 6090 kc, and is said to come on the air at midnight with five pips. Perhaps an easier station to log would be EPB, on 15,100 kc, which can often be heard between 9 pm and 10 pm. The best time to be sure of identification is at the latter hour, when station identification is given in French as "Ica Teheran." If you can log this one, send for their verification, as they are quite good in this regard.

PITCAIRN ISLAND

This small island in the Pacific has always had an especial interest for the writer, as it was our 100th country verification when we received our card for VR6AY back in 1938. We are indebted to "Radio News" for the following information concerning radio today on this small island. Mr. Nelson Dyett, who has been on the island for the last seven years, is operator at the commercial station ZKG, and also operates on the amateur bands under the call letters ZL2FR. Both he and Andrew Young, of VR6AY, have so far had no reply to their application for relicensing of their amateur stations. This will, perhaps, not worry Mr. Dyett, as he hopes to return to New Zealand shortly, but we hope the authorities will soon give VR6AY his old status.

VATICAN CITY

We know that a great number of our listeners are interested in the transmissions from HVJ, in the Vatican City, and direct from the station we have the following schedule of their programmes in English. There is a daily broadcast on 5968 kc and 9660 kc from 4.15 am to 4.30 am, when a different subject is given each day. Daily at 1.0 am there is a news bulletin in English on 9660 kc and 15,095 kc, while on Wednesdays at 1.30 am there is a weekly summary for India, South Africa, and New Zealand on 17,445 kc. On Sunday nights there is a Mass broadcast given on 5968 kc and 9660 kc, but we are afraid it will not be possible to hear either of these transmissions at the present time. The early morning broadcasts can be tuned in quite well, however.

CZECHOSLOVAKIA

The Czechoslovakian Broadcasting Corporation have sent us a full schedule of their transmissions, which now appear to be confined to the following frequencies:—6010 kc, 9550 kc, and 15,230 kc. English broadcasts can be heard at the following times:—4.45 am to 5.0 am on 9550 kc, 6.45 am to 7.0 am on 6010 kc, and also from 8.45 am to 9.0 am (this latter transmission would not be audible here, we think). In the 19-metre band on 15,230 kc there is a programme in English, Czech, and Slovak listed from 10.0 am till 11.0 am. We understand there are to be about five television stations constructed in this country in the near future, located at Brno, Prague, and Kosice.

CEYLON

We have just received a copy of the "SEAC Forces' Radio Times," which is published monthly by Radio SEAC. In addition to giving a complete programme schedule for the month of April, it is illustrated by many very original cartoons, some of which, we feel sure, caricature some of their announcers. We were interested to note that they list 9520 kc as being in use from 10.30 am till 2.0 pm, 2.30 pm till 8.0 pm, and 10.0 pm till 2.15 am. In an article by the Chief Engineer, he states that the new 7½-kw transmitter usually operates in the 16-metre band on 17,770 kc and that the 88-metre transmission has been reinstated. Readers should write for a copy of this interesting little magazine.

RULES FOR DX COMPETITION

SENIOR AND JUNIOR SECTIONS

AFTER considering the many suggestions received from our readers, we have at last drawn up the rules for the "Radio and Hobbies" 1947 DX Competition. The conditions under which this contest will be conducted will, we believe, give every reader an equal chance, whether he uses a simple home-made receiver or possesses a multi-tube communications receiver.

In order that the contest will not drag over a long period, it has been decided to limit the reception period to two months, with a further four months for the receipt of verifications.

After careful consideration, it has been decided to restrict the contest to the reception of international commercial short-wave stations and to exclude amateur phone stations. Undoubtedly these amateur stations provide a great deal of interest to listeners, but, generally speaking, the readers who follow our notes concentrate on the commercials.

The trophy presented by the Short-wave Editor will go to the winner of the Senior Section, and it is hoped in the next issue to announce what the prize will be for the Junior Section. If it is practicable, we also hope to give a special prize for what we consider the best entry, regardless of the actual number of points gained.

CONDITIONS:

1. Entry in both sections of the contest is open to all readers of this magazine resident in Australia, New Zealand, and Pacific Islands.

2. The contest is divided into two sections, Senior and Junior. In the Senior Section no restriction is placed on the type of receiver used, while in the Junior Section all reception must be on a receiver which can either be home-constructed or commercial type but must not exceed five valves if battery-operated or five valves (excluding rectifier) if AC type.

3. When submitting entries, contestants must specify which section they wish to enter.

4. The winner for either the Senior or Junior sections shall be the entrant who obtains the greatest number of points for verifications from international commercial radio telephone stations transmitting on any frequency from 2.5 mc upwards in the period between May 15, 1947, and July 15, 1947, both dates inclusive.

5. For the purposes of this competition, an international commercial radio telephone station shall be deemed one which for experimental or commercial purposes transmits music or speech on any frequency from 2.5 mc upwards in frequency.

6. Points for verifications will be allotted on the following basis:—

One point for each verification received and one point for each different country from which verifications are received. Total points will be calculated by multiplying the number of verifications by the number of countries—e.g., 40 verifications from two countries would equal 80 points, 10 verifications from eight countries would also equal 80 points. 100 verifications from five countries 500 points, 20 verifications from 20 countries 400 points.

7. Only one verification may be submitted for each station.

8. Entrants must submit list of verifications received by November 29, 1947, and, if required, be prepared to forward their verifications for inspection.

9. If called upon, an entrant must also be prepared to substantiate his logging either by submitting log or details of the report.

10. The following rules shall apply to all verifications:—

(a) The verification must incorporate the station's call letters or recognised slogan —e.g., KZRH, "Radio Saigon."

(b) Where more than one call-sign is mentioned on the one card or letter of verification, it must clearly indicate which call it verifies.

(c) Where a station is known to transmit on one frequency only, it is not necessary for this frequency to be quoted in the verification. Where a station should qualify for two or more verifications by virtue of having more than one assigned frequency, the verification must indicate which frequency is verified.

(d) Verifications of a stereotyped nature providing spaces for the insertion of time of logging, date, &c., can only be accepted if these particulars are completed by the station concerned.

(e) The verification policy of a station will be taken into account. This applies to stations whose policy it is to issue a verification which does not directly confirm the report submitted to the station.

(f) If the entrant's name is not mentioned on a verification, it will be necessary to produce the envelope received with that card or letter before the verification can be accepted.

(g) The winner in each section of the contest must be prepared to make a statutory declaration of the bona fides of his claims if he should be called on.

(h) The judges in the competition will be the Editor of "Radio and Hobbies" (Mr. J. M. Moyle) and the Short-wave Editor (Mr. Ray Simpson). All entrants to accept the judges' decision as final and legally binding.

It is hoped that the above rules will prove satisfactory to all our readers, and we look forward to some really fine entries and expect the winner to turn in an excellent log when the judging day comes along.

READERS' REPORTS

THE following readers have sent along letters and reports covering their reception during the past month:—

Mr. F. J. Smedley, Landsborough, Qld.; Miss D. Sanderson, Malvern, Vic.; Mr. P. J. Byard, Launceston, Tas.; Wm. Howe, Washington, D.C., U.S.A.; Mr. R. Black, Petersham, N.S.W.; Mr. J. Wiseman, Kew, Vic.; Mr. J. Adams, Wangoon, Vic.; Mr. W. R. Holland, Canterbury, Vic.; Mr. M. Krumbeck, Kogarah, N.S.W.; Mr. W. S. Milne, Invercargill, N.Z.; Mr. W. Davey, Bondi Junction, N.S.W.; Mr. J. D. Harrington, Cremorne, N.S.W.; Mr. A. Lee, Merewether, N.S.W.

THIS MONTH'S VERIFICATIONS

THE following readers have received cards or letters confirming their reception reports to the stations concerned:—

Mr. W. S. Milne: WRUS, 6040kc, 11790kc; WRUA, 15350kc; WRUL, 15290kc, 7805kc; WRUW, 9700kc; VUM2, 7255kc; KNBA/I; YFA4.

Miss D. Sanderson: Radio Maroc, 9080kc; HH3W.

Mr. F. J. Smedley: VLA4-6; VLC9, VLW3-7; VLR-2; VLH3-4-5; VLQ2-3; SEAC, 15120kc.

Our Own Listening Post: HVJ, 6190kc, 9660kc, 1509kc; Macau, 7500kc; NADI, 6170kc, first report from Australia; XGOA, 5918kc; SEAC, 17770kc; OLR2A, 6010kc; OLR4A, 11840kc; PCJ, 9590kc; Paris, 17850kc; WRUS, 9570kc.

SHORT-WAVE notes for the June issue are due by May 3, and for the July issue on June 14. They should be sent direct to Mr. Simpson, 80 Wilga-street, Concord-West, NSW.

ADDITIONAL FREQUENCIES FOR RADIO AUSTRALIA

WE have just received advice from the Department of Information that the following new call-signs and frequencies have been allotted:

VLA5	15320kc.
VLB4	11810kc.
VLB10	11740kc.

The first and second of these new stations will come into use on the 13th April, though at time of writing we do not know which sessions they will be used in.

It is interesting to note that 15320kc. is now being used by Radio Australia instead of the original frequency of 15315kc.

CHILE

The Chilean stations are among the best heard here from South America, and during the past few weeks we have heard one of the real old-timers again, in CE960, on 9595 kc —"Radio La Americana," located in Santiago, which can easily be logged when it comes on the air at 9.0 pm. It can be followed until after 11.0 pm, but then begins to fade out. Usually there is a lady announcer for the first hour, with a few sentences by a man which sound like recorded advertisements.

NEW STATION LOGGINGS

U.S.A.

ONE of the loudest U.S.A. stations we hi heard is KGEX on its new frequer of 17880 kc. This outlet is excellent, b in afternoon right up till closing time 7.45 pm, and can easily be found, as it at the end of the band. The East Co General Electric station gives us another r one in WGEX, which uses the same f quency and comes on the air at midnig Still another new G.E. station is WG which has been heard on 21590 kc at m night.

Two other new frequencies in use WCDA on 15270 kc, which is heard open at 8.15 am, and also the Boston stat WRUW, which comes up on 15290 kc 7 am in place of the usual WRUL.

AUSTRALIA

Once again we have another of the Depa ment of Information stations to report our new station loggings. This time it VLA10 on 17840 kc, which we have he in the afternoons from 2.45 pm till 3.45 in the session for N. America and S. Afri

JAVA

Batavia has been logged on 9550 kc, can be heard at quite good strength ev night, though it suffers interference times from nearby stations. The call let are not known, as the only other D. station we know on this frequency is Y which used to operate from Sourabaya in days before the war. This new one Batavia appears to be controlled by Dutch.

INDIA

All-India Radio are now using an a tional transmitter in the 31-metre band VUD11 on a frequency of 9680 kc, wh can be heard with the news in English 10.30 pm. At the same time you can hear the other Delhi station at wea strength on 9670 kc in a different program

F.E.A.

The Brazzaville transmitters seem to experimenting with new frequencies, as month we had word from Rex Gillett he had heard this station on 7000 kc the early morning, and now we have lo them on 17845 kc in the afternoons, w is being used in place of the old frequ of 17530 kc. News in English concludes 3.45 pm, and is at quite good strength.

FINLAND

Although a Finnish station has alr been heard on 11780 kc, we believe it to have the call of OFE, as that was call on our old verification. We have OIX3 operating on this same frequency in late afternoons. Strength is rather and rather difficult to identify, but if listen at 5 pm you can distinctly hear word Finland mentioned in what we sume to be Finnish, and also in the easily understood German. A news se is given from 5 pm till 5.15 pm, when a few words can be gathered to for report.

STATION ADDRESSES

STATION addresses are as popular as so here are a few more to add to list:—

OLR: Foreign Language Broadcasts, Czslovak Radio, Prague XII, Czechoslovakia.

Jaffa: Sharq al Adna, P.O. Box 636, Palestine.

Baden-Baden: Sudwesfunk, Baden-B Moltkestrabe 5, Kaiserin Elisabeth, F Zone of Germany.

CSWD: "Radio Renascenca," Rua Cap Lisbon, Portugal.

COBL: "Radio Cadena Suarites," Apa No. 541, Havana, Cuba.

XGOA: Central Broadcasting Admin tion, Sze Tang Hsiang, Nanking, China.

VUC: The Station Director, All-India R 1 Garstin-place, Calcutta, India.

WCRC: Columbia Broadcasting S Inc., 485 Madison-avenue, New York, USA.

CXA8: Radiodifusora CXA8, Av. Gral 30, Colonia, Uruguay.

XEBR: Radiodifusora XEBR, Esquina dan y Rosales, Hermosillo, Mexico.

OVERSEAS S.W. STATIONS NOW AUDIBLE

The following stations have actually been heard in this country during the past month and the majority should be audible on a sensitive receiver. All times are Australian Eastern Standard Time.

AUSTRALIA AND OCEANIA

'LA4. 11770kc. 25.49m. Shepparton. 6.30 am to 9 am, 5 pm to 6 pm (Sats only).
LA6. 15200kc. 19.74m. 6.45 pm to 9.30 pm (Sat. only).
LA8. 11760kc. 25.51m. 1 am to 1.30 am, 2 am to 3 am, 10 pm to 11 pm, 11 pm to midnight, midnight to 1 am.
LA9 21600kc. 13.89m. 5 pm to 6.15 pm, 9.30 am to 10.45 am, noon to 2 pm.
LA10. 17840kc. 16.82m. 2.45 pm to 3.45 pm.
LB. 9540kc. 31.45m. Shepparton. 11 pm to 12.15 am.
LB5. 21540kc. 13.93m. Noon to 2 pm, 1.15 pm to 5.29 pm (Sat. only).
LB6. 15200kc. 19.74m. 7.15 am to 9.30 am, 5 pm to 6 pm.
LB8. 21600kc. 13.89m. 2.45 pm to 3.45 pm except Sat., 10 pm to 11.30 pm, 6.30 pm to 10 pm (Sat. only).
LB9. 9615kc. 31.20m. 1 am to 2 am, 12.45 am to 1 am.
LC4. 15315kc. 19.59m. Shepparton. 1 am to 1.45 am, 2.45 pm to 3.45 pm, 4 pm to 4.45 pm, 5.30 pm to 6.45 pm except Sat., 6.55 pm to 10.45 pm, 12.30 am to 1 am.
LC6. 9615kc. 31.20m. 2 am to 3 am.
LC7. 11840kc. 25.27m. 11 pm to 12.15 am.
LC9. 17840kc. 16.85m. 6.45 am to 7.45 am, noon to 2 pm.
LC10. 21680kc. 13.84m. 5 pm to 6 pm, Sat. only.
LC11. 15210kc. 19.72m. 6.30 am to 9.30 am.
LG3. 11710kc. 25.62m. Lyndhurst. 4 pm to 4.45 pm, except Sat.
LG4. 11840kc. 25.34m. 2 am to 3 am.
LG5. 11880kc. 25.25m. Noon to 2 pm.
LG6. 15230kc. 19.69m. 2.45 pm to 3.45 pm, except Sat., 5.30 pm to 6.45 pm, noon to 5.20 pm. except Sat.
LG7. 15160kc. 19.79m. 6 am to 8 am, 1.45 am to 8.15 am, Sun.
LG9. 11900kc. 25.21m. 10 pm to 1.45 am.
LG10. 11760kc. 25.51m. 6.55 pm to 9.50 pm.
LH3. 9580kc. 31.32m. 6.28 pm to midnight daily.
LH4. 11880kc. 25.25m. 6 am to 9 am, 6.45 pm to 9 am, Sun.
LH5. 15240kc. 19.69m. 9.15 am to 6.15 pm daily.
LR. 9540kc. 31.45m. 8.30 am to 6.30 pm, 8.30 am to 5.15 pm, Sun.
LR2. 6150kc. 48.78m. 6 am to 8.15 am, 4.45 pm to midnight, 6.45 am to 8.15 am and 5.30 pm to midnight, Sundays.
LR3. 9660kc. 31.06m. Brisbane. 6 am to midnight daily.
LV3. 11830kc. 25.36m. Perth. 1.30 pm to 8.15 pm, noon to 8.15 pm, Sun.
LV7. 9520kc. 31.51m. 8 am to 11.45 am, 4.45 am to 11.40 am, Sun., 8.30 pm to 2 am, 8.30 pm to midnight, Sundays.
Numea. 6160kc. 48.70m. Noumea, New Caledonia. Comes in very well from 5.30 pm to 8 pm.
Fiji. 6170kc. 48.62m. Fiji. This weather station has again been heard at various times from around 8 pm.
Fiji. 6170kc. 48.62m. Fiji. This one is often heard in contact with Suva exchanging weather information.

AFRICA

Addis Ababa. 9618kc. 31.20m. Ethiopia. On Sunday morning a church service in English can be heard till closing at 2.
Algiers. 11765kc. 25.50m. Algeria. We were surprised to hear this outlet again in use at 7 am at good strength.
Algiers. 6040kc. 49.66m. This outlet carries the same programme, but not nearly as loud as 11765kc.
Algiers. 12115kc. 24.77m. Reported off the air, but this French station again heard at fair strength at 1.30 am.
9440kc. 31.80m. Brazzaville, FEA. Often for the news in English from this at 6.45 am.
9980kc. 30.10m. Same location. Quite a nice signal from this outlet as late as 1 am.
11970kc. 25.05m. Same location. This is the best one to hear the news at 6.45 am, and also good at 3 pm.
17845kc. 16.81m. Same location. The same outlet heard well with news at 2.45 pm, then music afterwards.
FZI. 700kc. 42.86m. Same location. Still another new outlet first reported by Rex Gillett and heard at 6.30 am.
OTM3 9370kc. 31.98m. Leopoldville, Belgian Congo. Not very good at our post, but heard every morning.
OTC2. 9745kc. 30.82m. Same location. A really fine station and plenty of English heard between 6.40 am and 7 am.
OTC1 17770kc. 16.88m. Same location. Possibly the weakest of these stations, and only occasionally heard around 11 pm.
Dakar. 11715kc. 25.60m. Senegal. An excellent signal when it opens at 5.15 pm with lady announcing and giving news.
Dakar. 15390kc. 19.49m. Same location. This is now a regular morning station and can be heard till after 7.30.
SUX. 7860kc. 31.15m. Cairo, Egypt. The best time to log this African is in the mornings around 6.30.
Capetown. 5883kc. 51.0m. South Africa. This is the only South African we have heard at our post. Closes at 7.5 am.
Tananarive. 6140kc. 48.66m. Madagascar. You will have to stay up late to hear this one, as it opens at 2 am.
Tananarive 9690kc. 30.96m. Same location. This one is much louder and can be used to check the one on 6140kc.
CR7BJ. 9650kc. 31.09m. Lourenco Marques, Mozambique. Have logged this well-known station at fine strength at 5.30 am.
CR7BF. 4925kc. 60.91m. Same location. Another of these Radio Club stations easily heard at 5.30 am.
VQ7LO. 4885kc. 61.41m. Nairobi, Kenya. An easily logged station and comes in best at about 5 am.
CNR3. 9080kc. 33.04m. Rabat, French Morocco. Heard at some locations in early morning and also in late afternoon.

CENTRAL AMERICA AND WEST INDIES

ZQI. 4700kc. 63.83m. Kingston, Jamaica. This is the new one heard as mentioned in special article.
VRR5. 12050kc. 24.90m. Stony Hill, Jamaica. This Cable and Wireless station heard relaying ZQI at 7 am, see article.
TIPG. 9618kc. 31.20m. San Jose, Costa Rica. An excellent station now when it opens at 10 pm. "La Vox de la Victor."
HP5J. 9605kc. 31.23m. Panama City, Panama. Another Central American coming in well from opening at 10.15 pm.
HP5A. 11695kc. 25.65m. Same location. Not as loud as HP5J but can be heard most nights around 10.30 pm.
HOXA. 15100kc. 19.87m. Same location. The Voice of Central America comes in nicely at 7 am with programme in English.
HHCM. 6160kc. 48.70m. Port-au-Prince, Haiti. Weak at our location but heard better in Victoria, we believe.
HH3W. 10130kc. 29.62m. Same location. This is very much louder and can easily be followed from around 9.30 pm.
TGWA. 15170kc. 19.78m. Guatemala City, Guatemala. Listen for this station coming on the air at midnight when strength is fair.
HI1Z. 6315kc. 47.50m. Ciudad Trujillo, Dominican Republic. Easily logged on a Sunday again from about 9.15 pm.
COHI. 6450kc. 46.47m. Santa Clara, Cuba. Improving in strength and heard most nights around 9.45 pm.
COCX. 9270kc. 32.36m. Havana, Cuba. The loudest of the Cubans at our location and heard best around 10.30 pm.

NORTH AMERICA

13 METRES.
WGEA. 21590kc. 13.90m. Schenectady, NY. This is the new outlet for this GE station and heard at midnight.
WNRX. 21610kc. 13.88m. New York, NY. The European programme is heard at 11.30 pm.
WCRC. 21570kc. 13.91m. Same location. Have heard this CBS station at 1.30 am and also around 7.30 am.
WLWL. 21650kc. 13.86m. Cincinnati, Ohio. Programme in Spanish at fair strength around 8.15 am.
KNBA/I. 21610kc. 13.88m. Dixon, Cal. Quite a good forenoon station and on some days is very nice at 10.30 am.

16 METRES
WGEX. 17880kc. 16.78m. Schenectady, NY. Not very loud but can be logged when it comes on the air at midnight.
WNBI. 17780kc. 16.87m. New York, NY. The news in English and then French can be heard around 9.45 pm.
WLWK. 17800kc. 16.85m. Cincinnati, Ohio. The European programme can be tuned in around 10.30 pm.
WLWL. 17955kc. 16.71m. Same location. Another Crosley station carrying the programme directed to Europe.
WCBX. 17830kc. 16.83m. New York, NY. This CBS station is quite good level at 1.30 am also at 7.30 am.
WRUW. 17750kc. 16.90m. Boston, Mass. The World Wide Broadcasting station is heard with programme in German at midnight.
WNRA. 18160kc. 16.52m. New York, NY. This NBC outlet can be logged around 11.0 pm and also at 5.30 am.
KRHO. 17800kc. 16.85m. Honoluiu, TH. At lunch time this Pacific station is really good entertainment.
KCBF. 17850kc. 16.81m. Delano, Cal. American Melodies is a good programme from this one at 11.45 am.

19 METRES
WCDA. 15270kc. 19.65m. New York. This is the new outlet for this station and heard opening at 8.15 am.
WRUW. 15290kc. 19.62m. Boston, Mass. Used in place of WRUL and comes on the air at fair strength at 7.0 am.
WGEO. 15330kc. 19.57m. Schenectady, NY. Not particularly loud but can be logged till closing at 7.45 am.
WBOS. 15210kc. 19.72m. Boston, Mass. This Westinghouse station is audible around 1.30 am and also at 8.0 am.
WNBI. 15150kc. 19.80m. New York. Latin American type programme around lunch time.
WRUL. 15130kc. 19.83m. Boston, Mass. Programme beamed to Europe can be heard usually around 8.45 pm.
WLWR. 15250kc. 19.67m. Cincinnati, Ohio. At midnight this one reaches quite good strength.
WRCA. 15150kc. 19.80m. New York, NY. Programme in German is heard around midnight but not very loud.
KGEI. 15130kc. 19 83m. Belmont, Cal. This GE station is very fine in the early afternoon.
KGEX. 15210kc. 19.72m. Same location. This sister station is also good at the same time.
KNBA. 15250kc. 19.67m. Dixon, Cal. Some fine programmes heard from this outlet in the afternoons.
KCBA. 15240kc. 19.69m. Delano, Cal. Used in the forenoon in parallel with KCBF on 17850kc.
KWIX. 15290kc. 19.62m. San Francisco. Cal. Another forenoon station and usually quite good.

25 METRES.
WOOW. 11810kc. 25.40m. New York, NY. On some nights reaches good strength by closing time of 10.15 pm.
WCBN. 11830kc. 25.36m. Same location. This CBS station comes on the air at 8.15 am in parallel with WCDA on 15270kc.
WOOW. 11870kc. 25.27m. Same location. An excellent station at 6.30 am.
WNBI. 11890kc. 25.22m. Same location. Latin American programme can be heard at 7.0 am.
WRUW. 11730kc. 25.57m. Boston, Mass. Quite a loud station around 7.30 am.
WNRA. 11790kc. 25.45m. New York. A programme in French can be logged from opening at 8.15 am.
WLWS. 11710kc. 25.62m. Cincinnati, Ohio. The Latin American programme is heard from this one at 8.15 am.
WRUL. 11730kc. 25.58m. Boston, Mass. The same programme can be heard from this outlet.

WGEA. 11810kc. 25.40m. Schenectady, NY. A programme in Portuguese is heard from this GE station at 8 am.
KCBR. 11810kc. 25.40m. Delano, Cal. A fine musical programme comes in every afternoon.
KWID. 11900kc. 25.21m. San Francisco, Cal. Still the best USA station on this band around 9 pm.
KWIX. 11890kc. 25.22m. Same location. This station is heard in parallel with KWID.
KNBX. 11790kc. 25.45m. Dixon, Cal. Quite a loud signal with musical programme at 8.30 pm.

31 Metres.

WOOW. 9490kc. 31.61m. New York, NY. Comes on the air at 8.15 am with programme in French.
WRUA/S. 9570kc. 31.35m. Boston, Mass. These two stations carry the same programme as WOOW.
WLWK. 9590kc. 31.28m. Cincinnati, Ohio. This Crosley station is also beamed to Europe at breakfast time.
WNRX. 9750kc. 30.77m. New York, NY. Rather hard to hear this one in mornings, due to interference from Leopoldville.
WGEO. 9530kc. 31.48m. Schenectady, NY. The South American beam is used from this one opening at 8 am.
WLWR. 9700kc. 30.93m. Cincinnati, Ohio. Also used in the same programme, but not as loud as WGEO.
WCRC. 9650kc. 31.09m. New York, NY. On some forenoons this one has been heard opening at 10 in Spanish programme.
WCBX. 9490kc. 31.61m. Same location. Programme in Portuguese comes on the air at 8 am.
KGEI. 9530kc. 31.48m. San Francisco, Cal. One of the best on the band with their night programme.
KNBA. 9490kc. 31.61m. Dixon, Cal. Another very loud station nightly until closing time at 2 am.
KCBR. 9700 kc. 30.93m. Delano, Cal. Another good entertainment station every night.
KWID. 9570kc. 31.35m. San Francisco, Cal. This station can also be followed till closing at 2 am.
KCBA/P. 9750kc. 30.78m. Delano, Cal. Always a good one if you want to enjoy the programme without interruption.
KRHO. 9650kc. 31.09m. Honolulu, TH. Always at good strength in relay with mainland stations.

49 Metres.

KNBI. 6060kc. 49.50m. Dixon, Cal. Puts in a very loud signal every night from 7.

CANADA

CKNC. 17820kc. 16.84m. Montreal, P.Q. Can be heard in programme to Europe around 7.30 am.
CKCS. 15320kc. 19.58m. Same location. At 8 am this Canadain is one of the best stations on the band.
CKRA. 11760kc. 25.51m. Same location. Have heard this one opening on some mornings at 9.20 am.
CBLX. 15090kc. 19.88m. Same location. A very interesting station from 10 pm in local type programme.
CJRX. 11720kc. 25.60m. Winnipeg, Man. Only hear this one on a Sunday afternoon till it closes at 5 pm.
CBRX. 6160kc. 48.70m. Vancouver, BC. News and weather reports from this West Coast station at 1 am.
CFRX. 6070kc. 49.46m. Toronto, Ont. This Rogers Bros.' station is heard at some locations around 9 pm.

MEXICO

XEWW. 9500kc. 31.58m. Mexico City, Mexico. Still the best from this country and very good at midnight.
XERQ. 9615kc. 31.12m. Same location. Opens with "Rhapsody in Blue" at 11 pm and announces as Radio Continental.
XEBT. 9625kc. 31.17m. Same location. This one is best in the late afternoons on Sundays.
XDY. 9924kc. 30.23m. Same location. The only time to hear this Mexican is at 1 am till about 1.15 am.

SOUTH AMERICA

CE622. 6220kc. 48.23m. Santiago, Chile. This station can again be heard around 10 pm, but rather weak as yet.
CE960. 9595kc. 31.27m. Same location. Comes on the air at 9 pm and gives slogan "Radio La Americana."
CE970. 9720kc. 30.86m. Valparaiso, Chile. Have heard this one again in early mornings.
CE1160. 11990kc. 25.02m. Santiago, Chile. One of the best Chile stations and heard well around 10 pm.
CE1190. 11900kc. 25.21m. Valparaiso, Chile. Still being heard after KWID leaves the air. "Land of Hope and Glory" opening.
HCJB. 9958kc, 31.12m. Quito, Equador. Not quite as loud as last month, but audible nightly around 10 pm.
HCJB. 12450kc. 24.11m. Same location. This outlet is much better and very good at the same time.
HCJB. 15115kc. 19.85m. Same location, Spanish type programme can be heard in the early mornings.
YVIRX. 4800kc. 62.50m. Maracaibo, Venezuela. Faint signal when it comes on the air at 8.30 pm.
YV1RL. 4810kc. 62.33m. Maracaibo, Venezuela. Another one which is slightly louder when it opens at 8.30 pm.
YV5RN. 4915kc. 61.04m. Caracas, Venezuela. The best of the Venezuela stations, and opens around 8.30 pm.
YV5RM. 4970kc. 60.36m. Caracas, Venezuela. In a few weeks this one should reach much better strength at night.
LRM. 6180kc. 48.54m. Mendoza, Argentina. Comes in well on some nights just after 8 pm.
CAX4J. 9340kc. 31.12m. Lima, Peru, Quite often heard till late on a Sunday afternoon.
LRY. 9455kc. 31.73m. Bueonos Aires, Argentina. Very good on Easter Sunday from 9.30 pm.
ZPA5. 11950kc. 25.10m. Encarnacion, Paraguay. Heard every night for over a week from just after 10 pm.
CXA19. 11835kc. 25.35m. Montevideo, Uruguay. Listen for this one in the mornings around breakfast time.

INDIA AND ASIA

XGSA. 6040kc. 49.66m. Nanking, China. One of the new Nanking stations heard at 10 pm.
XGSC. 6095kc. 49.21m. Same location. Another of these stations heard very weakly at midnight.
XGTA. 9450kc. 31.75m. Shanghai, China. Another new frequency for this one and heard at 10 pm.
XORA. 11690kc. 25.66m. Same location. One of the most regular Chinese and heard nightly.
XGOA. 9730kc. 30.82m. Chungking, China. Comes in fairly well on most nights.
XGOA. 11830kc. 25.35m. Same location. Not in regular use we think, but quite often heard at 9 pm.
XGOY. 9665kc. 31.03 m. Same location. Heard with a Church service in English till 1 am on Easter Monday.
XGOY. 11910kc. 25.19m. Same location. Comes in well on most nights but not an interesting station.
XGOE. 9820kc. 30.56m. Kwelin, China. Very distorted on most nights but careful tuning helps a bit.
XMTA. 12210kc. 24.56m. Changsha, China. One of the clearest Chinese stations and heard at 9 pm.
XTPA. 11650kc. 25.73m. Canton, China. News and music from this one at 8.15 pm.
XOPD. 9550kc. 31.41m. Hangchow, China. This one has eluded us so far but heard in Victoria by Miss Sanderson.
Batavia. 9550kc. 31.41m. Java. This is the new station which we mention in the notes this month.
YHN. 11000kc. 27.27m. Jokjakarta, Java. Still coming in very well every night and lots of English heard.
PLY. 10060kc. 29.79m. Bandoeng, Java. Another of the Java stations heard around 8.30 pm.
SEAC. 6075kc. 49.38m. Colombo, Ceylon. Quite good on most nights but never as loud when it first opened.
SEAC. 9520kc. 31.51m. Same location. This one can be heard after the Perth station closes down at 2 am.
SEAC. 11770kc. 25.49m. Same location. Best time to hear this Colombo station is at 1 am.
SEAC. 15120kc. 19.84m. Same location. This is the loudest of all their outlets and provides good entertainment at night.
ZBW3. 9510kc. 31.55m. Hongkong, China. Very hard to follow as the quality is terrible and interference bad.
Singapore. 4825kc. 62.18m. Malaya. Excellent now the noise level is decreasing and easily heard after midnight.
Singapore. 11735kc. 25.56m. Rather hard to separate this one from nearby stations, but English can be heard at 1.30 am.
Singapore. 15275kc. 19.64m. This is the best of all the Singapore outlets and comes in very well nightly.
KZRH. 9640kc. 31.10m. Manila, Philippine Islands. Still coming in nicely, though not as strong as it was prewar.
KZPI. 9710kc. 30.90m. Manila, PI. Sometimes this one is better than KZRH at the same time.
Saigon. 11780kc. 25.47m. French Indo-China. Not a patch on what it used to be but audible at 9 am and at 8. pm.
Macassar. 9360kc. 32.00m. Celebes. Has improved at our location and gives some good recordings nightly.
WLKS. 6105kc. 49.14m. Kure, Japan. No being heard at many places and heard be just before closing at 8 pm.
HS8PD. 5990kc. 50.08m. Bangkok, Sian Rather a scratchy signal but you can he it nightly.
Rangoon. 6040kc. 49.67m. Burma. St pounding out their native type programm which we hope interests the natives.
CR8AA. 9230kc. 32.43m. Macau, Portu guese China. Another station with ve poor quality around 10.30 pm.
Kuala Lumpur. 6170kc. 48.62m. Selango This one is best late at night.
VUDII. 9680kc. 30.99m. New Delhi, Indi This is the new one mentioned in our ma article this month.
JCKW. 7220kc. 41.55m. Jerusalem, Pale tine. Still being heard in the early hour till closing at 5.30 am.

EUROPE

HER4. 9535kc. 31.47m. Schwarzenbou Switzerland. The news in English can heard at 8.15 am .
HEK3. 7380kc. 42.65m. Same locatio Very good signal when it opens at 6 am with news in French and German.
HER3. 6160kc. 48.66m. Same locatio Always a good signal from this Swiss st tion around 6.30 am.
HEI5. 11710kc. 25.61m. Same locatio Excellent in the programme for Austra on Tuesdays and Saturdays opening 5.15 pm.
HER5. 11865kc. 25.28m. Same location. Th outlet is used in parallel and often is t louder of the two stations.
HER7. 17784kc. 16.87m. Same locatio Listen for this one on Monday at 6 p though it is rather weak now.
OLR2A. 6010kc. 49.90m. Prague, Czech slovakia. Quite a nice signal in the ea morning.
OLR4A. 11840kc. 25.34m. Same locatio Although not listed, we have heard t outlet opening at 4.30 pm.
OIX2. 9503kc. 31.57m. Lahti, Finla Listen for this one around 6 am.
OIX3. 11780kc. 25.47m. Same location. reported elsewhere, this outlet can be log at 5 pm but not very loud.
SBT. 15150kc. 19.80m. Motala, Swed The lesson in English can still be hea around 5.15 pm.
SDB2. 10780kc. 27.83m. Same locati This is the loudest Swedish station a is quite good at 6.30 am.
PGD. 6025kc. 49.78m. Helversum, Neth lands. Have heard this one some morni opening at 7.0 am. This is correct cal
PCJ. 9590kc. 31.27m. Same location. P gramme to Australia from this one Tuesdays. (Discontinued for about th weeks).
PHI. 11735kc. 25.57m. Same location. T outlet has also been heard in mornings 7 am. This is correct call.
PCJ. 15220kc. 19.71m. Same location. N in English heard at 7.15 daily. Also he from 10.30 pm to midnight.
PHI. 17770kc. 16.88m. Same location. Ag heard on a Thursday morning at 2 am also occasionally at 11 am.
TAP. 9465kc. 31.70m. Ankara, Turk Listeners' Post Bag comes in well on s mornings and good musical programm
CSW7. 11040kc. 27.27m. Lisbon, Portu This is the only Portuguese station he this month at our post. Heard 7 am.
Radio Andorra. 5980kc. 50.02m. The n in English can be heard from this one 7 am.
Milan. 11810kc. 25.40m. Italy. Never loud but is always audible around 7 a
Milan. 9630kc. 31.15m. Italy. This sta can also be logged at the same time, but as good.
Madrid. 9370kc. 32.00m. Spain. Chan frequency quite a bit and never long in the same place. Heard at 6.30
ZAA. 7850kc. 38.15m. Tirana, Alba This station is found right alongside C around 6.0 am.
Radio Rodina. 9330kc. 32.10m. Sofia, garia. The news in English and gramme details heard at 6.30 am.
Azores. 7017kc. 42.76m. Ponta Delg Quite a nice signal on most morn Closes with clock striking at 7 am.
SVM. 9935kc. 30.20m. Athens, Greece. V on the air in early mornings is exce strength with special sessions.
Athens. 7295kc. 41.12m. Greece. Ra hard to follow the news in English it is given at 6.15 am.
Leipzig. 9730kc. 30.83m. Germany. C in quite well in late afternoons with musical programmes.
Brussels. 17840kc. 16.82m. Belgium. improved slightly at 10 pm, when not fered with by NAVE, &c.
HVJ. 6190kc. 48.47m. Vatican City. gramme in English has been heard at 6

OFF THE RECORD — NEWS & REVIEWS

By JOHN MOYLE

This month's reviews include a number of records from the April list received too late for inclusion in our last issue, as naturally we must work a few weeks ahead of publication date. They are a highly interesting batch, particularly the Delius violin concerto, which will receive a warm welcome from many record enthusiasts.

LBERT SAMMONS, Violinist with Liverl Philharmonic Orchestra. Conducted by Malcolm Sargent. Violin Concerto (Delius). umbia. DOX.825/7.

his is a set of records which in its way a bright spot in a series of releases which, m glad to say, is being similarly illumted at more and more frequent intervals. ius is a composer who only of late years received the recognition to which he is a fate not unusual in musical history. As esult, I feel he is not understood as he uld be.

his violin concerto is a typical example the Delius method of expression. Its form not the same as that generally applied such works. It has movements, but they rather loosely applied, and are of mood ier than of manner. It has, in fact, more common with the variations form, but again, the foregoing is true. There are ral fairly well defined ideas, the chief of which is beautifully announced by violin in the first few bars, but they described as figures—a nicely indefinite which fits the case.

ie work therefore resolves itself into a of the most sensitive sound. All these gs are used in part to create a musical sody which flows through the mind, its qualities contrasting vividly with the st mathematical development of subjects for instance, is found so forcefully in hoven's Fifth Symphony. It is just as that, unless you have that type of mind, us will never be completely compreible to you.

ie performance is of the highest class. mons has just the right approach and h to bring out the magic of the score, the orchestra has the sensitive response out which the work would be as ing. I can only advise you not to miss records, for if they do not present ultimate in performance, they are good gh to warrant the fullest respect. Without tling Sargent, it would have been inting to note what Becham would have of it. He is, of course, an outstanding uctor of Delius.

NDON PHILHARMONIC ORCHESTRA, ucted by SIR THOMAS BEECHAM. phony No. 6 in C Major" (Schubert) arts). HMV ED.463/5. EDS.466.

ubert symphonies are remarkable proons in many ways. They exhibit very y all that Schubert was and could do. ally they are always beautiful and ently magnificent, even though their y and magnificence are more in what ing said than in the way it is said. ert had a mind which simply brimmed with melody and ideas, so perfectly ssed as to carry full weight with every His limitations by comparison with great symphonists are those of method r than of matter. Having said his say, eatment of what he has said tends to a rather simple developmental process he himself was one of the first to ise.

these characteristics are present in this ony. It is musical and melodious ghout, but its progression is somewhat ntary. Beecham is an ideal man for such as this, because his fine sense ing, and his ability to turn a simple by well-judged accent and variation npo, give meaning to passages which vise would be rather obviously straightd, and add grace to those already ul.

result is a performance which everyone ppreciate. It is an example of a con with a fine orchestra who understands tely what he is about, gilding the best rawing from the remainder a new in-

after all, the touch of Franz Schubert nething so much to be thankful for e must be grateful for it just as it stands. There is no exception in this symphony.

Recording, balance of orchestra, &c., is typical of the Beecham-Philharmonic combination, which is the same as saying that it is first class.

OSSY RENARDY, Violinist with Piano Accompaniment—"Adagio in E Minor" (From Violin Concerto K219) (Mozart), and "Allegro Movement in C Minor" (Brahms). HMV ED.467.

The whole question is whether you find these remade isolated movements acceptable or not. Certainly there is nothing to indicate that violence has been done to the music, which is more than can be said about some other efforts which have been heard of late. Otherwise there is no criticism to be levelled at the performance, which is competently produced. Recording is OK.

INDIANAPOLIS SYMPHONY ORCHESTRA. Conducted gy Fabien Sevitzky—"The Uninhabited Island Overture" (Haydn). HMV. EB.366.

This is a work which is not often played, but is none the less attractive for that. The performance is adequate without being brilliant. I found it very easy on the ears, and well worth better acquaintance. Play it over and see whether you agree.

MAGGIE TEYTE, Soprano. Piano Accompaniment by Gerald Moore — "Chanson D'Avril" and "Le Colibri." HMV. EC.151.

An artist, this lady, if ever there was one. She has just the air and fine sense required for such songs, and upon which their success depends. The recording is good on all counts, and the accompanist lives up to his reputation in fine support. One to be recommended.

RICHARD TAUBER, Tenor—"Impatience" (Thine is My Heart) and "Red Rose." Parlophone. AR 392.

This is the type of song in which, to my way of thinking, Tauber shows up to best advantage. He sings them so well it seems rather a pity that his selection of songs is not always so happy. As a result, this record goes quite high up on the list, which by this time must be quite a formidable one.

Other recent releases include the following:

H.M.V.

DUKE ELLINGTON AND HIS ORCHESTRA "Chelsea Bridge" — Duke Ellington (Pno.); Otto Hardwick, Johnny Hodges, Ben Webster, Harry Carney, Barney Bigard (Reeds); Rex Stewart, Wallace Jones, Ray Nance (Tpts.); Joe Nanton, Juan Tizol, Lawrence Brown (Tmb.); Fred Guy (Gtr.); Junior Raglin (Bass); Sonny Greer (Dms.); and "Going Out the Back Way"—Johnny Hodges and his Orchestra. — Johnny Hodges (Alt.); Harry Carney (Bar.); Ray Nance (Tpt.); Lawrence Brown (Tmb.); Duke Ellington (Pno.); Jimmy Blanton Bass); Sonny Greer (Dms.). EA.3477.

SIDNEY BECHET AND HIS NEW ORLEANS FEET-WARMERS—"Baby Won't You Please Come Home"—Sidney Bechet (Clt. and Sop. Sax.); Henry Allen (Tpt.); J. C. Higginbotham (Tmb.); Wellman Braud (Bass); James Toliver (Pno.); James (J. C.) Heard (Dms.); and "Texas Moaner"—Sidney Bechet (Clt. and Sop. Sax.); Charlie Shavers (Tpt.); Willie "The Lion" Smith (Pno.); Everett Berksdale (Gtr.); Wellman Braud (Bass); Manzie Johnson (Dms.). EA.3482.

DICK LEIBERT, Organ—"At Dawning" and "Song of Love." EA.3449.

PAUL FENOULHET AND HIS ORCHESTRA —"Let it be Soon" and "Mary Lou." EA.3471

PERRY COMO WITH ORCHESTRA—"Girl of My Dreams" and "Tempation." EA.3472.

GLENN MILLER AND HIS ORCHESTRA— "Glen Island Special" and "Pagan Love Song." EA.3473.

WAYNE KING AND HIS ORCHESTRA— "Remember" and "Say it with Music." EA.3474.

VAUGHN MONROE AND HIS ORCHESTRA —"The Things we did last Summer" and "Carolina Moon." EA.3475.

DOREEN HARRIS WITH ORCHESTRA— "When Alice Blue Gown Met Little Boy Blue" and "When London is Saying Good-night." EA.3476.

ARTIE SHAW AND HIS ORCHESTRA— "Rockin' Chair"—A. Shaw, L. Robinson, G. Kearsey, G. Auld, M. Folus; A. Baker (Reeds); O. Page, L. Costaldos, S. Lipkins (Tpts.); R. Conniff, J. Jenny, M. Samuels (Tmbs.); J. Guarnieri (Pno); M. Bryan (Gtr.); E. McKinney (Bass); D. Tough (Dms.) with strings, and "Solid Sam." (Personnel unavailable). EA.3486.

"Sinfonia Concertante" (Revised 1943) (Walton) (5 parts)—Phyllis Sellick (Pianist), and CITY OF BIRMINGHAM ORCHESTRA, conducted by William Walton. (a) Death of Falstaff; (b) "Touch her Soft Lips and Part." (Incidental music to film "Henry V") (Walton). (Philharmonic String Orchestra conducted by Walton). EB.363/5.

DAVID ROSE AND HIS ORCHESTRA— "Begin the Beguine" and "Night and Day." EA.3448.

PAUL FENOULHET AND HIS ORCHESTRA —"You Keep Coming Back Like a Song" and "It's the Bluest Kind of Blues my Baby Sings." EA.3479.

TOMMY DORSEY AND HIS ORCHESTRA— "A Door Will Open" and "There is no Breeze." EA.3480.

BETTY RHODES WITH ORCHESTRA— "Rumours are Flying" and "I'd Be Lost Without You." EA.3481.

JOE LOSS AND HIS ORCHESTRA—"One Night in Old Seville" and "Save a Piece of Wedding Cake for Me." EA.3483.

GLENN MILLER AND HIS ORCHESTRA— "This Changing World" and "Under Blue Canadian Skies." EA.3484.

PERRY COMO WITH ORCHESTRA— "Winter Wonderland" and "Surrender." EA.3485.

COLUMBIA

DEBROY SOMERS BAND — "A Stanford Rhapsody"—Founded on Charles Villiers Stanford's "Songs of the Sea." (Intro. Drake's Drum; Homeward Bound; Devon, O Devon; The Old Superb). (Arr. Haydn Wood). DOX.828.

LOUIS KENTNER, Pianist—"Nocturne in A Major" (Field); "Nocturne in G Major (Field). DOX.829.

GARDE REPUBLICAINE SAXOPHONE QUARTET — "Minuet" (Boccherini, arr. Meyet), "Traumerei" (Schumann, arr. Meyet). DO.2953.

BEATRICE KAY, Vocal and the Elm City Four, with Orchestra—"The Curse of an Aching Heart" and "If I Was a Millionaire." DO.2954.

XAVIER CUGAT AND HIS ORCHESTRA— "Babalu" Afro-Cubano (Lecuona) and "Bambarito" Rhumba (Rosell). DO.2982.

DINAH SHORE WITH XAVIER CUGAT AN HIS ORCHESTRA—"You, So It's You," a "I May Be Wrong, but I Think You're Wo derful." DO.2983.

VICTOR SILVESTER AND HIS BALLROO ORCHESTRA—"One Night in Old Sevil and "Orchids in September." DO.2980.

FRANK SINATRA WITH ORCHESTRA "Paradise" and "You Go to My Hea DO.2981.

XAVIER CUGAT AND HIS ORCHESTRA "Good, Good, Good" and "Say It Over Agai DO.2969.

LOU PREAGER AND HIS ORCHESTRA "Someday You'll Want Me to Want You" a "Lonely Footsteps." DO.2970.

DINAH SHORE WITH ORCHESTRA—"Y Keep Coming Back Like a Song," and " Gonna Depend on the Way That the W Blows." DO.2972.

FRANKIE CARLE AND HIS ORCHESTRA "Rumors Are Flying" and "Either It's L or It Isn't," DO.2973.

HARRY JAMES AND HIS ORCHESTRA "And Then It's Heaven," and "I Guess Expected Too Much." DO.2974.

DANNY KAYE WITH ORCHESTRA—"T Fairy Pipers," and "Anatole of Par DO.2975.

REGAL ZONOPHONE

FAIREY AVIATION WORKS BAND—"Ov ture for an Epic Occasion" (2 par (Wright). G.25082.

FELIX MENDELSSOHN AND HIS HAW IAN SERENADERS — "Intermezzo" "Caprice Viennois." G.25083.

SHIRLEY THOMS, Singing and Yodell With Guitar—"When It's Moonlight on Trail" and "My Star in the Sky." G.25

THE RHYTHMIC TROUBADOURS — You Love Me" and "Though You're in L With Somebody Else." G.25101.

MONTE REY WITH ORCHESTRA—"Gr ada" and "Magical Moonlight." G.25102.

KAY KYSER AND HIS ORCHESTRA—" Buttermilk Sky" and "There's No One You." G.25099.

THE RHYTHMIC TROUBADOURS—"Go Good, Good" and "The Wonder of Yo G.25100.

JIMMY LEACH AND THE NEW ORGA LIANS—"The Excuse Me Waltz" and Then." G.25094.

BILLY WILLIAMS SINGING WITH CHESTRA—"You're Nobody 'Til Someb Loves You" and "When I Marry I'll Ma for Love." G.25095.

LES BROWN AND HIS ORCHESTRA— Guess I'll Get the Papers (And Go Hon and "When You Make Love to Me (D Make Believe)." G.25096.

SLIM DUSTY — "THE DUSTY TR YODELLER"—WITH GUITAR—"You D Know How Sad I Feel" and "A Mo Yodelling Song." G.25092.

DECCA

THE MILLS BROTHERS—"I Don't K Enough About You" and "There's No But You." Y.6005.

MARY MARTIN WITH ORCHESTRA— It Again" and "I Get a Kick Out of Y Y.6007.

BING CROSBY WITH XAVIER CU AND HIS ORCHESTRA—"Hasta Manana" "Night and Day." Y.6008.

CONNEE BOSWELL AND THE PAULE SISTERS—"Who Told You That Lie" "I'm Gonna Make Believe." T.6009.

BING CROSBY WITH THE ANDR SISTERS—"Good, Good, Good" and "Sibo Y.6006.

PARLOPHONE

GERALDO AND HIS ORCHESTRA— render" and "I'd Like to Get You Al A.7590.

DOROTHY SQUIRES WITH ORCHEST "It's a Pity to Say Goodnight" and "Sa Piece of Wedding Cake for Me." A.759

GERALDO AND HIS ORCESTRA—"Ca Patrol" and "Skyliner." A.7592.

JOE DANIELS AND HIS HOTSHC "Down Beat" and "Swing Fan." A.7589.

BENNY GOODMAN AND HIS ORCHES —"Pity the Poor Lobster" and "Love D Grow on Trees." A.7587.

BESSIE SMITH—BLUES SINGER. Hot Classic No. 20—"Back Water Blues." Ac by James P. Johnson (Pno.). Recorded February, 1927. And "Nobody Knows You're Down and Out." Accomp. by Ec Allen (Cnt.); Cyrus St. Clair (Tuba); Cla Williams (Pno.). Recorded 15th May, A.7588.

NEW WAY OF MAKING RECEIVERS

(Continued from Page 47)

faulty circuits are rejected without the remainder of the batch being held up.

The next steps are spraying on of graphite for resistors through a stencil and cleaning of unwanted material from the slots, &c. After this, "ECME" automatically inserts metal sockets for valves and so on. Once again the job is automatically tested and faulty plates rejected. The plate is then subjected to an overload electrical and thermal ageing process, which increases its stability and reliability, and after this is sprayed with lacquer to seal it off. This completes the first series of processes, all of which are carried out in enclosed machinery.

The free prefabricated components—movable vanes of semi-variable capacitors, valves, &c.—are next added to the plate and once again tests are carried out.

Meanwhile, branch conveyor machines have produced the metal inserts (for example, mains plug and switch parts) in premoulded recesses and grooves in the cabinet of the set. These inserts and strips are then connected by graphite spraying and subsequent burnishing, which produces the main voltage dropping resistor within predetermined parts of the cabinet. After this, the cabinet and its components undergo electrical and thermal ageing just as the insulated plates did. Then there is a further test, after which the plates are inserted in a cabinet, automatic electrical contact being made as this occurs. Finally there is a test of the whole set for signal reception.

The saving in time and manpower of the method is obvious and it will be clear immediately also that the rate of production can be instantly adjusted by regulating the flow of plates into the plant.

HAM NOTES

(Continued from Page 68

arying the VFO with the final on—might e an idea to switch it of, or at least leave he key up. It will only worry the locals nen.

HSIAL used up quite a lot of VK power dur-ng the week—on about 14050kc. and generally —sometimes gets to T7.

A third member of the Treharne family as joined the hams. Often a son follows his father's footsteps, but in this case father follows his two sons. Congratulations nd welcome to VK2BM.

2ML, 40K, 4FL, 2GI, and 2RK did some od work in an emergency the other day. 4L was in a little trouble and the gang lped him out.

2MT, of Wollongong, lost a couple of masts om high winds. The antenna at the oment could be classified as a clothes line, t the results, well why worry.

The VO's are workable at the moment, 02T, 14015kc., VO2G, 14060kc., VO6F, 14015 ., are all audible about 2100 hours.

BERU SENIOR CONTEST

The senior section of the RSGB Empire sts opened up at 1000 hours on April 12th. VK d ZL stations were active and by 1000 hours e 20 MX band had opened to Europe and large number of G stations were afriving South America. VK2ADE and VK2EO emed to be doing well among the NSW en-nts.

Plenty of publicity had been given to the t and practically all stations were conver-nt with the rules, a very different te of affairs from those existing during recent W contest.

WIAW, ARRL HQ station was heard pub-sing the contest and requesting W station refrain from answering CQ BERU calls. e W stations were quite patient and kept remarkably well and it was greatly ap-ciated.

100 COUNTRIES POST-WAR

'or those amateurs who have tried and succeeded, here are Harry Hawkins, 2YL's 102 countries post-war—VK, ZL, pua, VKG, PK123 PK4, PK6, VS1 to VS7, , VU, XZ, UAO, UA3, UI8, XU, CR7, CR9, J5 Okinawa, J9 Marshalls, KG Mariannas, Jima, PK6, VR2, FO3, KH6, KP4, KM6, 6, KL7, VE, VO, W, XE, TI, TG, KZ5, CO, YV, OA, HC, HK, CE, LU, PY, VQ2 to VQ6, VQ8, ET, IG, ZS, ZE, ST, SU, FA8, G, GM, GW, EI, GI, TF, Y1, HZ, ZC4, I, SV, CP, HB, D, F, EA, ZB1, OZ, OK, PA, LA, SM, YA, HA, YJ, MX, ZK, KA, NY4, FK8, KJ6, EQ.

FURTHER 6MX DX RECORDS

hile full information is not yet available, ral W stations have verified the fact that stations have been in contact with an in Peru. A ZS station has also been in munication with a PAO. These contacts k all previous 6MX records. The OA was rted for two hours solid in the States. further interstate contacts have been rted in Australia, and quite a number he UHF gang have been concentrating 16G in the interim.

THE 1K5-G FOUR VALVE SET

(Continued from Page 45)

ment supply, and with fair success. The chief effect appears to be a reduction in power output.

The A and B-battery connections are brought out through a plug and socket for ease of connection. Anything from four to seven pins will do, provided the two are wired to correspond. The bias batteries were attached directly to the chassis but they could be installed separately and connected to the receiver through the battery plug.

The chassis designed for the receiver measures 10in. x 6½in. x 2½in. with a ½in. flange at the back. The tuning dial and gang mount centrally on the chassis and there is enough space elsewhere to accommodate up to four valves.

The aerial and earth terminals mount on the rear edge, the aerial lead going straight to the aerial coil. The RF amplifier valve mounts alongside the aerial coil, its plate lead running forward to the plate lug on the RF coil.

The components in the plate circuit of the detector range along the front edge of the chassis, coupling to the audio volume control and thence up to the grid of the 1K5-G audio amplifier.

No difficulty should be encountered in assembling and wiring this set since the position of most components and leads is indicated clearly in the underneath wiring diagram. Begin by mounting the valve sockets, taking care to see that they are turned to ensure the shortest possible plate leads. Then add the filament wiring, running the positive lead through the "off-on" switch to the appropriate pin on the battery socket. The "off-on" switch, by the way, is built on to the rear of the audio volume control.

After that it is merely a matter of adding the various other leads and components and finally the resistor panel.

As mentioned previously, a couple of leads have to be installed above the chassis. One of these goes from the rear stator to the grid cap of the 1K5-G RF amplifier. A lead should also be taken from this point down through the top of the aerial coil can to the grid lug.

The detector grid resistor and condenser connect between the front stator section and the grid cap of the detector, with a lead passing from the condenser down through the top of the can to the grid lug on the detector coil.

When the job of construction is completed, check over everything carefully, then connect to the "A" battery. Switch on and see that the filaments light normally. Then plug in the loudspeaker, connect the "B" batteries, aerial and earth, and see if the set works.

TUNING IN

If all is in order you should be able to tune in stations immediately and the reaction control should operate smoothly. A tendency to howl may require some experiment with the detector circuit.

To peak up the trimmer condenser begin by setting the detector trimmer to about one-half its normal capacitance. Tune in a station around 1400 Kc and, while rocking the dial slightly, adjust the RF trimmer until you get maximum signal strength. It is wise to keep the detector just below the point of oscillation while this adjustment is being made.

The tuning dial used on the original set is probably the best choice for a simple receiver and it is calibrated with station call signs to suit the "J" type tuning gang.

If you are using a calibrated dial of this type, tune into a station near 2FC and, by loosening the grub screw or the pointer screw, set the pointer so that it indicates accurately the station to which the set is tuned.

Now reset the receiver so that it is tuned to a station about 1300 or 1400 Kc and, by adjusting the detector trimmer, bring the station to its calibrated position on the dial. The RF trimmer will then have to be screwed in or out to peak the circuit again.

ANSWERS TO CORRESPONDENTS

UNDER THE PERSONAL SUPERVISION OF THE TECHNICAL EDITOR

R.J. (Tharwa) reports having built a crystal et and more recently "Little Jim 2."

A. Glad to note that the crystal set was success but you have evidently made some ror in your "Little Jim 2" receiver. Perps the process of rebuilding it twice has oved too much for the tuning coil or one the other parts and has caused a fracre in a lead. The Reinartz coil without can should be quite okay. The simplest ay of checking the valve would be to ve someone take it to the nearest radio aler at the first opportunity and have it ecked by his valve-tester.

D.G. (Richmond, NSW) acknowledges reipt of plans for the "Two Valve Set for adphones" and asks about operating voltes.

A. For headphone reception there is no al need to operate the set from more an 45 volts high tension. However, you uld push up the high tension voltage to 5 if you have any idea of trying to work loudspeaker from it. However, we would mind you that the power output from 1 a 1J6G valve is very small indeed.

W. O. Wells (18 Regent-street, Sandy Bay, s.) is interested in making workshop velties and would like some reader to pply him with a sketch or picture of ckey Mouse jumping.

A. We trust that the above note will catch eye of some other reader with artistic idencies who can help you in your problem.

T.J. (Cairns, NQ) sends in a subscription "R. and H." and says he is building the le portable set recently described.

A. Thanks for your subscription and we st that the little set turns out a success.

K.M. (Coburg, Vic.) asks whether it would possible to add another audio stage to ex" as was done with the "1Q5—Two."

Considerable care would have to be en in adding the extra stage as there uld be a distinct chance of microphony instability. However, there is no obtion whatever to substituting a Reinartz for the loop aerial if you want it that

Glad to note that you appreciated article on chassis layout.

R. (Williamstown, Vic.) mentions that has built up the "1946 Advance" but power transformer becomes very hot no voltage is evident at the valve fila- terminals.

It appears from your letter that there short circuit in the 6.3 volt winding. may be within the transformer itself lt may have occurred in the wiring. onnect the wiring from the 6.3 volt terals and switch the set on without the fier in position. If the transformer overheats, and there is no sign of ge between the terminals, then the ing is evidently shorted. Alternatively, may find that the filament wiring has ed to the chassis somewhere along its h and you have already earthed one of the winding at the transformer. If transformer is proved to be at fault will probably have to buy another one, s you can dismantle it yourself and the trouble.

L. (Millswood Est., SA) asks for comon a multimeter circuit.

Sorry that we have not the time at lisposal to examine every aspect of your sted circuit but you seem to underfairly clearly just what you want idea of passing the heavier currents gh a standard 1-ohm resistor and meaessentially the voltage drop across quite an old one and works satisfacin most cases. It has the one drawof introducing more resistance into ircuit under test than would be the with a direct shunt. However, you e in a position to know whether the series resistance is important.

(Leichhardt) has a set which is noisy eration and also fades.

ome of the trouble may be due to a valve or component in the set, causle roaring noise you mention. Howthe most likely cause is faulty house made evident by the set picking up of the signal via the power mains. ggest that you earth the chassis to a pipe and install the most efficient system you can arrange. If this fails ur up the trouble completely, try in a line filter.

(Toowong) sends in circuit diagram nment.

ie circuit could probably be made to work out quite well except that you may strike trouble with instability. This will require decoupling in the plate circuit of the detector and perhaps the first audio amplifier. The plate of the 1P5-GT should be fed from plus-90 rather than plus-22½ volts

R.B. (Barwon Heads, Vic.) is interested in recent references to wartime detergents and special hard water soaps.

A. As far as we know these products are not commonly available on the Australian market and there is some doubt about their manufacture in peacetime. It seems that the whole position is very indefinite at the mon ent.

B.M. (Colebrook, Tas.) tells us of the excellent results he had from a two-valve receiver when stationed in Broome.

A. Many thanks for your letter which we read with interest. The matter of high-tension voltage is related to the amount of audio power which the operator requires from a set. In many cases 4.5 volts is ample.

R.B.S. (Manningham, SA) sends in his subscription and asks our advice on the best loudspeaker to use on the "T.R.F. Fidelity Nine" receiver.

A. We would suggest either a 10in. or 12in. speaker for this set, preferably the latter. Thanks for your subscription.

K.B. (Port Melbourne) notifies a change of address and suggests that there must have been an error in one of the simple vibrator supply circuit in the February "Reader Built It" page.

A. You are quite correct about the circuit using a buzzer. There should be a connection between the filament of the 1G4G and the positive side of the 8 mfd. condenser. It is a fairly obvious omission which several readers have brought to our notice. It should be possible to obtain reasonable results from your "Two-valve set for headphones" on the 10-metre band by winding up a suitable short-wave coil, but care will be necessary in grouping the coils around the proposed wave change switch to avoid losses and absorption effects. An untuned RF stage will not contribute anything much to the gain, but it does prevent dead spots due to absorption by the aerial. The idea is well worth while if you are keen to experiment.

D.R. (Burnie, Tas.) notifies change of address and says he has had considerable success with the "1Q5-two" receiver.

A. Your change of address has been noted and we trust that you will get equally good results from "Monty."

E.M.C. (Deepwater, NSW) asks what size condenser should be fitted to a 12-volt generator to stop radio interference.

A. There is no guarantee that a single condenser will prevent the interference being heard, but you can try an 0.5 can type, mounting the can directly on the frame of the generator. If possible, earth the frame of the generator and also one side of the supply line.

L.W.A. (Camden, NSW) expresses his appreciation of "Radio and Hobbies" and suggests that we should publish some articles on aerial systems.

A. A very good suggestion, L.W.A., which we will be following out in the near future.

M.H.T. (Warragul West, Vic.) notifies us of a change of address and says he is pleased with the results obtained from the "1Q5-Two."

A. Glad to note you were pleased with the little set, and your future issues will be sent to the new address.

R.G. (Broken Hill) reports that he has failed to obtain any results from "Little Jim II."

A. It is hard to say what is wrong with the set as so many other readers have reported complete success. If you cannot find the cause of the trouble yourself, you may be able to seek the aid of someone else who has had more experience with receivers. You apparently have only 25 turns on the grid winding of your home-wound coil, and this is by no means enough. Assuming the usual 1¼in. diameter former, something like 110 turns would be necessary. You can obtain a page of coil data by sending in 6d.

J.W. (Hurstville, NSW) suggests that we should publish a page of data every month relating to the popular valve types, such as the 6J8, 6V6, &c.

A. We have so much to publish these days that we cannot promise a feature along the lines of your suggestion. Much of the information is available anyway in valve data charts and booklets prepared by the valve manufacturers. Another point is that typical circuit arrangements do not mean very much unless they are related to the rest of the receiver or amplifier. In view of the fact that we publish only once a month, we would never be able to keep up with the number of valves in current use or being released.

THE following reprints are available on application at our offices, 60-70 Elizabeth street, Sydney. They will be sent, post free, on receipt of stamps or postal notes.

How to Build a Synchronous Clock.
4 Pages ... 1/-

A Pendulum Type Electric Clock.
8 Pages ... 1/-

Build Your Own Windcharger.
8 Pages ... 1/-

Coil Details for Small Receivers.
1 Page ... 6d

Radio Circuit Symbols.
1 Page ... 6d

Collecting Verification Cards.
1 Page ... 6d

HOW TO SUBMIT YOUR QUERY

1. Queries will be answered in rotation through the columns of our magazine if not accompanied by a fee for a postal reply.

2. Queries, neatly and concisely set out, will be answered by mail as quickly as possible if accompanied by 1/- in postal notes or postage stamps. Endorse envelope "Query."

3. Back numbers are rarely available but reprints of most circuits, wiring diagrams, and parts lists will be supplied for 6d each, minimum charge 1/-. Thus a circuit, layout, and parts list will cost 1/6 in stamps or a postal note. Endorse envelope "Circuit."

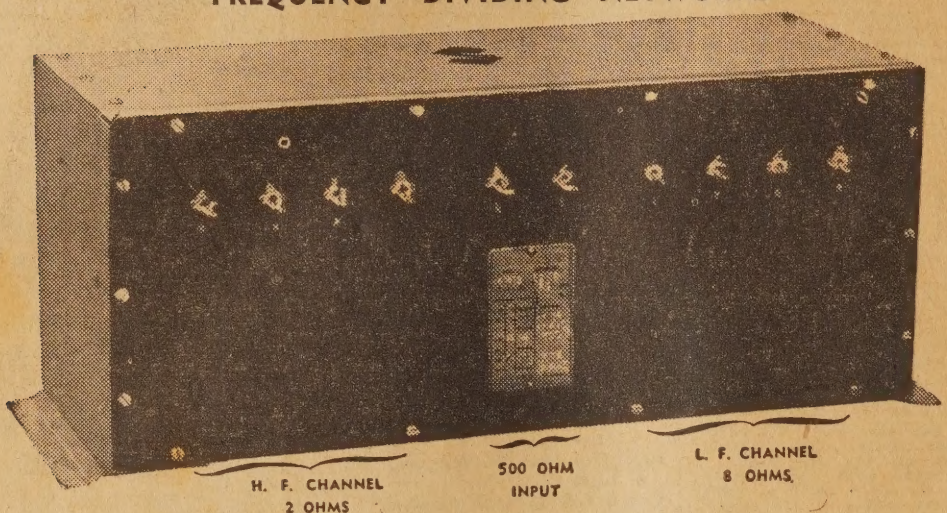
4. Blueprints of exact size chassis layouts with all essential holes and cut-outs will be supplied if available for 2/6. Endorse envelope "Blueprint."

Address your letters to the Technical Editor, "Radio & Hobbies," Box 2728C, GPO, Sydney.

RED LINE

EQUIPMENT

FREQUENCY DIVIDING NETWORKS



GENERAL

Type D482 is specifically designed for High Fidelity radio gramophones and small talking picture sound installations. The unit consists of a shunt type cross-over network using high "Q" inductances and is intended for insertion in a 500 ohm line. Loud speaker input transformers are incorporated in the unit, the voice coil winding being brought out for each channel to 4 terminals for connection either in series, for conventional operation, or in parallel for use with loading resistances for medium and high power circuits with wide range characteristics such as the "Full Frequency Range Amplifier"* This latter method will present what is virtually a constant load to the output tubes with an extremely high damping factor and lead to a marked improvement in transient response.

** Reprints of the articles describing design and construction of this amplifier are available in pamphlet form from:—*

SPECIFICATIONS

OPERATING LEVEL: Plus 39 db max. INSERTION LOSS: Approximately .5 db. CROSS-OVER FREQUENCY: 500 cps. ATTENUATION: Low frequency channel—20 db at 1200 cps. High frequency channel—20 db at 150 cps. INPUT IMPEDANCE: 500 ohms. OUTPUT IMPEDANCES: Low frequency channel—8 ohms. for 1 "Rola" Type G12. High Frequency channel—2 ohms. for 1 "Rola" Type 8M (if parallel connected, output impedances will be 2 ohms and .5 ohms and require to be shunted with resistances of 2.67 ohms and .66 ohms respectively.) FREQUENCY RESPONSE: (Both Channels.) Within 1 db from 30 cps to 12,000 cps. WEIGHT: 18lbs. SIZE: 13 x 5½ x 5.

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A GUARANTEE OF DEPENDABILIT

ANSWERS TO CORRESPONDENTS

(Continued from Page 77)

H.W. (Queenscliff, NSW) reports fine re- from the "TRF Quality Six" but is very ppointed in the "Majestic Radiogram."

It is very evident from your remarks all is not well with the "Majestic" re- r as it could certainly not be criticised he grounds of harshness and distortion. act, from a design point of view, it is elaborate than the "TRF Quality Six." sure that you are taking the negative back from the correct output valve as its would be disastrous if taken from the valve. There may also be some "snag" ie arrangement of the loudspeakers as qualities would suffer very much if two ore of the loudspeakers were operating taneously over the same band of fre- ies with the cones out of phase. We nly assure you that the "Majestic" is a ughly reliable design and should give you lete satisfaction if operating properly.

. (Yarrara, Vic.) reports having built ie "IQ5-two." "Little General" and the stmas Portable" with complete success.

Thanks for your report on these sets ve are glad to note that they have all d out very well. It is just a pity that did not know of "Radio & Hobbies" r.

. (Woodville, SA) says he likes reading H.'" and sends in an advertisement.

Your advertisement has duly been at- d to, and we would thank you for your encouraging remarks.

G. (Nimbin, NSW) sends in an adver- nt and expresses his satisfaction with o & Hobbies."

Your advertisement has duly been at- t to and we are pleased to note that ind our magazine interesting.

(West Maitland, NSW) reports having p "Tex" with good results.

Many thanks for your report on this nd you certainly appear to be doing well with it. The IQ5-two circuit is a good one and many readers have ed good results. Your failure to re- anything at all could only be explained error in the wiring or a faulty com- . You can obtain a valve chart by to the Amalgamated Wireless Valve 47 York-street, Sydney, and enclosing ence in stamps.

(Emu Flat, Vic.) says he would like to re small battery sets using valves like 06 and the A609. He would like to ond with other sixteen-year-olds in lia who are interested in radio. The me and address is Mr. Norman Harper, lat, via Toobarac, Vic.

The valves you mention are now very ut of date and, in any case, the circuits ch they could be applied are very con- al. We are rather puzzled at the cir- u send in for comment and it would ore time than we could spare to work t what all the components can possibly However, at first glance we are not ed by it.

L. (Castlemaine, Vic.) reports having p "Little Jim II," which receives all n and many interstate stations.

Thanks for your report on this set and glad to note that it is performing so well. Your addition of a small amplifier to work a loudspeaker is quite a good scheme.

A.McL (Bundaberg) joins issue with us over a recent reference in these columns to the mediocre performance of type 6V6G valve tri- odes.

A. It is not a difficult matter to show that the power output of these valves as tri- odes is considerably less than the power avail- able as tetrodes with the same operating voltages. This was the reason for our sug- gestion, coupled with the fact that it is quite easy to apply feed-back to them. We do not doubt that your receiver sounds every bit as good as you say, but are not convinced that even an expert could tell the difference be- tween triodes and pentodes with feed-back when their measured characteristics are prac- tically identical on instruments. However, that is another matter. Thanks for the suggestion re the microphone article and we will keep it in mind.

K.G. (Moonee Ponds, Vic.) tells how he had occasion to help out a constructor who had attempted to build the "Amateur Junior." Points which proved "a trap for young players" were: (1) use of spirits of salts instead of soldering flux, (2) tuning condensers out of line and shorting, (3) potentiometers con- nected the wrong way, (4) confusion between screens and suppressors, (5) arcing across the rectifier socket due to the spirits of salts, (6) blob of solder shorting of high tension wiring and last, but not least, a preliminary test without the loudspeaker plugged in.

A. Your letter certainly makes a sorry re- cital and we have listed the points in case they should forewarn other beginners. We will consider an article covering points like these.

N.K. (North Sydney, NSW) asks a couple of questions about resistance coupling valves.

A. The answer to your questions is not nearly as simple as you apparently imagine. It is not clear from your letter whether you are referring to an audio amplifier or have some idea of using the valves as resistance coupled RF amplifiers. There is also the matter of operating bias, screen voltage and high tension voltage. We cannot imagine why you should want to resistance-couple two type 24 valves to a 2B7, as the overall gain would be enormous and steps would have to be taken to ensure stability by a system of decoupling.

R.L.H. (Wauchope) asks whether we have any details for the construction of a canoe.

A. We have not described any very large canoes in "Radio & Hobbies," but a small, fairly simple craft appeared in the February, 1947, issue. You may have already seen this.

P.R. (Newcastle, NSW) takes us to task about an article in the March issue dealing with the application of radar to marine navi- gation.

A. We feel that your remarks are hardly justified as there was no suggestion that radar is purely war-time development or one to be credited to British inventors. The broad principles of radar were appreciated before the war by most radio authorities. The fact remains that the very rapid and vast de- velopment in this field was due entirely to war- time conditions. The statement that the "battle of Britain first impressed radio loca- tion upon the world" is perfectly true and at this time British scientists certainly did lead the world. Later on, the American radio in- dustry produced large quantities of excellent equipment and the interchange of information kept the Allies ahead in radar technique. This was one of the deciding factors of the war.

R.W.B. (Bridgetown, WA) reports having built up a receiver which is a combination of the job in the February, 1943, issue and the bat- tery operated amplifier in November, 1942.

A. Many thanks for your report on this set and we are glad to note that it has proved so successful. The magnetic pickup you have, apparently has a sustained high note response but you can cut it down and simultaneously reduce the needle scratch by shunting the pickup directly with a condenser. Try various values to get just the effect you desire. The only way to eliminate the hash caused by the genemotor is to insert RF chokes in series with the leads, by passing the chokes either to the frame of the genemotor or to earth. It is really a matter of trying out various combinations until you discover the most suc- cessful. The problem is complicated by the fact that you are using the same batteries for filaments and genemotor, and this may necessi- tate RF filtering in the filament leads. We doubt whether the output from the dynamic microphone would be sufficient to excite the amplifier question.

K.H.B. (Toowong) advises of a change of address and asks about the version of the "Little General" using a 6F7 valve.

A. Your change of address has duly been noted, but we are at a loss to understand why you have not found the circuit in ques- tion successful. If it is operating as it should it would certainly load up a 5-inch loudspeaker on the stronger stations.

WANTED TO BUY, SELL OR EXCHANGE

Readers wishing to buy, sell or exchange goods are invited to insert an advertisement on this page. The cost is 9d per line; minimum charge 2/3. Approximately 6 words to a line. Advertisements for the next issue must reach our office by WEDNESDAY, MAY 7. Dealers' advertisements not accepted.

FOR SALE: New Duplex 1-valve, in cab., with batt. Plug-in coils, £4. 29 First St., Ashbury, Sydney.

FOR SALE: 2-valve bedside wireless. Had little use. Good pair earphones, £5. Without batteries, or offers. Miss S. Terkelsen, Coolabunia, via Kingaroy, Qld.

TWO F.S. 6 transceivers in excellent working order, complete with their vibrator supply units and batteries. What offers. Reply: F. W. Eade, Park Avenue, Kotara.

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